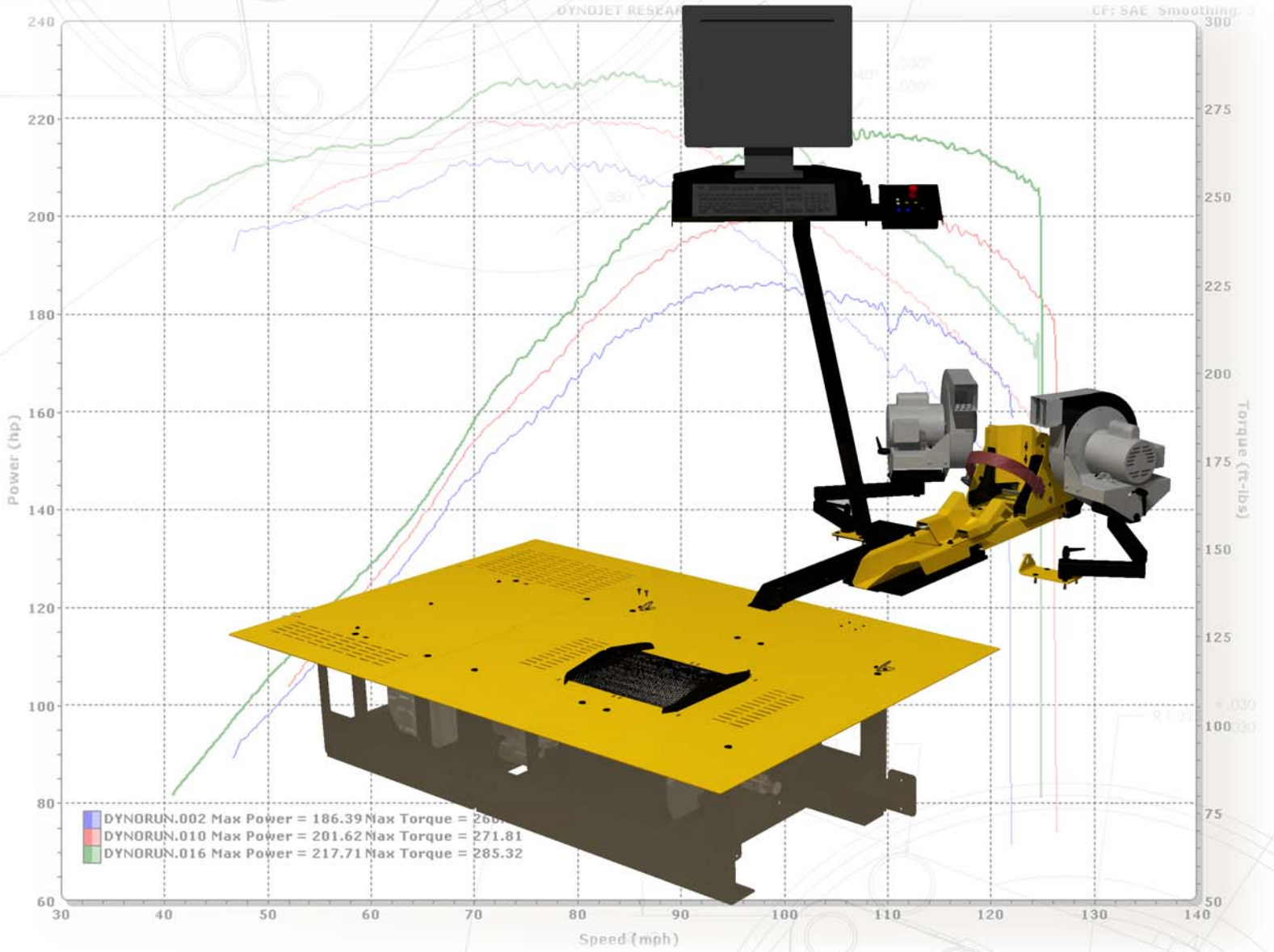
Dynojet RESEARCH


Power (hp)
Torque (ft-lbs)
Speed (mph)
DYNORUN.002 Max Power = 186.39 Max Torque = 266
DYNORUN.010 Max Power = 201.62 Max Torque = 271.81
DYNORUN.016 Max Power = 217.71 Max Torque = 285.32

Installation Guide

For In Ground Model 200iP and 250iP Motorcycle Dynamometers

P/N 98229103.04

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Installation Guide For In Ground Model 200iP and 250iP Motorcycle Dynamometers.

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Part Number: 98229103 Version 4 (03/2011)

Dynamometer Number: _____

Eddy Current Brake
(Retarder) Number:_____

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WARNINGS

Disclaimers

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Dynojet reserves the right to revise this publication and to make changes from time to time in the content hereof without obligation of Dynojet to notify any person of such revision or changes.

Dynojet is not responsible for false operation due to unexpected dynamometer operation such as may be caused by static, software bugs, hardware failure, etc.

Dynojet is not responsible for damage resulting from improper installation of the dynamometer or from improper service rendered to the dynamometer. Dynojet is not responsible for damage incurred due to alteration of the dynamometer or components, use of unapproved parts, or abuse to the dynamometer.

Do not connect or disconnect cables or components on the dynamometer with the power on.

Always wear protective clothing, ear protection, and eye protection (goggles, safety glasses) when using and servicing the dynamometer.

CAUTION

Equipment Power Requirements

The dynamometer has specific power requirements. Connecting the dynamometer to the incorrect voltage will void the dynamometer warranty. Installation may require a licensed electrician.

WARNING

Potentially Lethal Voltages

Components attached to and within the dynamometer operate with potentially lethal voltages. To provide the greatest assurance of safety, the AC power cord(s) must be disconnected from the power source before servicing electrical components or wiring. Disconnect all power cords before servicing electrical components for the greatest assurance of safety.

CAUTION

Electrostatic Discharge Precautions

Electrostatic Discharge

Electrostatic Discharge (ESD), or static shock, can damage electronic components within the dynamometer. The damage may occur at the time of an ESD occurrence, or the shock may degrade the component, resulting in a premature component failure later. To avoid ESD damage, always practice good ESD control precautions when servicing the dynamometer. Dynojet designs its dynamometers to be very tolerant of static shocks by the users, but the electronics are vulnerable when the electronics are exposed. ESD occurs as a result of a difference of potential between two objects when the two objects touch. Damage occurs as a result of the energy released when the discharge (touch) occurs. The difference of potential can accumulate by as simple an action as a user moving across carpet or a seat. If that person's energy is discharged directly to the electronics, the electronics can be damaged.

Precautions

To protect against ESD damage, you must eliminate the difference of potential before the electronics are handled. Touch the chassis of the dynamometer before touching any of the electronics. By touching the chassis, you discharge any static shocks to the chassis instead of to the electronics.

If you are holding a circuit board or dynamometer component in your hand when you approach the machine, touch the chassis of the dynamometer with your hand before installing the circuit board or component.

When handing a circuit board or component to someone, touch that person with your hand first, then hand them the component.

Always carry circuit boards in anti-static bags when the boards are exposed (removed from the dynamometer).

WARNING

Battery Fire and Explosion Hazards

There is a danger of explosion if the battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

Automotive Batteries

In operation, batteries generate and release flammable hydrogen gas. They must always be assumed to contain this gas which, if ignited by burning cigarette, naked flame or spark, may cause battery explosion with dispersion of casing fragments and corrosive liquid electrolyte. Carefully follow manufacturer's instructions for installation and service. Keep away all sources of gas ignition and do not allow metallic articles to simultaneously contact the negative and positive terminals of a battery.

Do not allow the positive and negative terminals to short-circuit. The dynamometer chassis is tied to the negative side of the battery. Do not short between the positive battery terminal or the starter connections to the chassis. In addition, make sure metal tools such as screw drivers, wrenches, and torque wrenches do not come in contact with the negative and positive terminals of the battery. Short circuiting the terminals of the battery can cause burn injuries, damage to the dynamometer, or trigger explosions.

Charging

Batteries being charged will generate and release flammable hydrogen gas. Charging space should be ventilated. Keep battery vent caps in position. Prohibit smoking and avoid creation of flames and sparks nearby.

Wear protective clothing, eye and face protection, when charging or handling batteries.

Other Potential Hazards

The AC power outlet shall be installed near the equipment and it shall be easily accessible to allow for disconnect before service.

The dynamometer should be located in a well ventilated area. There is a carbon monoxide hazard with all internal combustion engines. Engine exhaust contains poisonous carbon monoxide gas. Breathing it could cause death.

Any dyno room design must incorporate sufficient exhaust extraction.

Always wear proper ear and eye protection when operating the dynamometer.

Never operate the dynamometer with the covers removed.

Never stand behind the dynamometer when in operation.

Never operate the dynamometer when there is excessive vibration or noise. Resolve these problems before proceeding.

Never fuel the vehicle on the dynamometer unless appropriate safety measures are taken.

Verify brake operation before beginning any dynamometer testing.

Verify the vehicle is properly secured to the dynamometer.

Never operate the blowers without the guards installed.

Exercise care with any dynamometer testing; portions of the dynamometer and vehicle may become hot.

As with any equipment using electricity and having moving parts, there are potential hazards. To use this dynamometer safely, the operator should become familiar with the instructions for operation of the dynamometer and always exercise care when using it.

Do not repair or replace any part of the dynamometer or attempt any servicing unless specifically recommended in published user-repair instructions that you understand and have the skills to carry out.

CHAPTER

1

SPECIFICATIONS AND OPERATING REQUIREMENTS

Thank you for purchasing Dynojet's In Ground Model 200iP/250iP Motorcycle Dynamometer. Dynojet's software and dynamometers will give you the power to get the maximum performance out of vehicles you evaluate. Whether you are new to the benefits of a chassis dynamometer or an experienced performance leader, the repeatability and diagnostic tools of WinPEP 7 software and a Dynojet dynamometer will give you the professional results you are looking for.

This document provides instructions for installing the in ground motorcycle dynamometer (dyno). This document will walk you through operating requirements, installation, accessories, and basic dyno operation. To ensure safety and accuracy in the procedures, perform the procedures as they are described.

Document Part Number: 98229103

Version 4

Last Updated: 03-16-11

This chapter is divided into the following categories:

- Introduction, page 1-2
- Dynamometer Specifications and Requirements, page 1-5
- Dyno Electronics, page 1-10
- Verify the Pit Dimensions, page 1-11

INTRODUCTION

Before installing your dyno, please take a moment to read this guide for installation instructions, dyno features, and other important information.

This guide is designed to be a reference tool in your everyday work and includes the following chapters and information:

SPECIFICATIONS AND OPERATING REQUIREMENTS

This chapter describes the requirements and specifications for the dyno.

INSTALLATION

This chapter describes the procedures for installing the dyno.

ACCESSORIES

This chapter lists each dyno accessory alphabetically and describes the procedures for installing and using the accessory.

CONTROL PANEL INTERFACE OPERATION

This chapter describes the Control Panel Interface (CPI) operating procedures.

BASIC DYNO OPERATION

This chapter describes basic dyno operating procedures.

RED HEAD INSTALLATION

This appendix describes the procedures for installing the Red Head anchors.

POWER REQUIREMENTS

This appendix describes the power requirements and installation instructions for all locations excluding North America.

EEC FINGER GUARD & DOOR SAFETY SWITCH KIT

This appendix describes the procedures for installing the EEC finger guards and door safety switch.

THETA CONTROLLER

This appendix describes how to make power adjustments to the theta controller.

CONVENTIONS USED IN THIS MANUAL

The conventions used in this manual are designed to protect both the user and the equipment.

example of convention	description
	The Caution icon indicates a potential hazard to the dynamometer equipment. Follow all procedures exactly as they are described and use care when performing all procedures.
	The Warning icon indicates potential harm to the person performing a procedure and/or the dynamometer equipment.
	The Record # icon reminds you to record your dynamometer and/or eddy current brake (retarder) number on the inside cover of this manual.
Bold	Highlights items you can select on in the software interface, including buttons and menus.
➤	The arrow indicates a menu choice. For example, "select **File ➤Open**" means "select the **File** menu, then select the **Open** choice on the **File** menu."

TECHNICAL SUPPORT

For assistance, please contact Dynojet Technical Support at 1-800-992-3525, or write to Dynojet at 2191 Mendenhall Drive, North Las Vegas, NV 89081.

Visit us on the World Wide Web at www.dynojet.com and www.winpep.com where Dynojet provides state of the art technical support, on-line shopping, 3D visualizations, and press releases about our latest product lines.

CONFIRMATION OF COMPLIANCE TESTING AND CERTIFICATION

Dynojet Model 200iP, 200iPX, 250iP, and 250iPX dynamometers have been tested to NFPA 79:2002 and UL 508(A) standards and pass the requirements.

Certificate Number: US72080032.01

YOUR DYNO ROOM

This section is not meant to imply that a dyno room is essential to repeatable results on a Dynojet dynamometer. However, a dyno room with an engine cooling intake fan, exhaust extraction, and noise reduction capabilities can add a new dimension to your shop.

A proper dyno room design will help to ensure repeatable, accurate runs. A good dyno room should do the following:

- minimize noise
- provide a controlled environment for testing
- provide a view window (safety glass) for customers
- be designed with safety in mind

Intake Air Fan—After building your dyno room, you will need to supply an intake air fan. The intake air fan supplies air to cool the bike's engine while supplying fresh oxygen for you and your bike to breathe. It is a common misconception that you cannot tune a bike without a large fan simulating exact road conditions; however, a good cooling fan is the only requirement for consistent diagnostics and tuning. The installed fan should be 5200 CFM.

Equalizer Box—If the air flow rate coming into the dyno room is greater than the air flow rate leaving the dyno room, the room will become pressurized. A pressurized dyno room will make measured power misleading. To compensate, you need an equalizer box. The equalizer box is a baffled (to reduce noise) vent to the outside of your dyno room. The size of the equalizer box is dependent on the size of your dyno room and the size of your fans.

Exhaust Extraction—An exhaust fan is needed to remove exhaust gasses, especially carbon monoxide, from the dyno room. Carbon monoxide is potentially lethal to people if not removed from the room and will affect engine power when mixed with fresh air. Plans for exhaust extraction (P/N 73429201) are available from Dynojet.

WARNING

Engine exhaust contains poisonous carbon monoxide gas. Breathing it could cause death. Operate machine in well ventilated area.

Fire Suppression—Always have adequate fire suppression or fire extinguishers in your dyno room.

Industrial Noise Control, Inc.—Industrial Noise Control, Inc. offers a zinc-coated steel room custom built to your specifications. This room meets all dyno room requirements. The dyno room must be clean and dry with a comfortable room air temperature above 32 degrees Fahrenheit (0 degrees Celsius), and have some system of exhaust extraction. For more information on a dyno room, refer to your Pre-Installation Guide For Model 200i, 250i, 200iP, and 250iP Motorcycle Dynamometers (P/N 98129103).

DYNAMOMETER SPECIFICATIONS AND REQUIREMENTS

The following specifications and requirements will help you set up your dyno area and verify you have the requirements to operate your dyno safely.

BATTERY REQUIREMENTS

Your 200iP/250iP dyno is designed to carry a group 24 deep-cycle discharge series battery for operating the starter, power carriage, and optional wheel clamp. The typical dimensions for this series of batteries are 27 cm long by 17 cm wide by 23 cm tall (10.625-inches by 6.75-inches by 9.125-inches). The mounting is flexible so a battery that has dimensions close to this will work satisfactorily. The built-in battery cables are configured for top-post batteries. This battery is not included with your dyno. You will need to provide this battery. For more information on installing the battery, refer to "Installing the Battery" on page 2-30.

CHASSIS SPECIFICATIONS

description	specifications
Length	
with standard carriage	allow 304.80 cm (120.00 in.)
with extended carriage	allow 355.60 cm (140.00 in.)
pit covers	137.16 cm (54.00 in.)
Height	
from bottom of dyno to top of dyno	45.72-46.67 cm (18.00-18.38 in.)
from top of pit to drum guard	5.40 cm (2.13 in.)
from top of pit to top of tire carriage	50.64 cm (16.00 in.)
Width	
dyno with eddy current brake	179.07 cm (70.50 in.)
pit covers with eddy current brake	208.28 cm (82.00 in.)
Weight	
model 200iP drum module/crated dyno	725 kg (1600 pounds)/817 kg (1800 pounds)
model 250iP retarder module/crated dyno	953 kg (2100 pounds)/1,043 kg (2300 pounds)
Drum	
diameter	45.72 cm (18.00 in.)
width	50.80 cm (20.00 in.)
Frame	structural steel channel and angle
Maximum Speed	322 KPH (200 MPH)
Maximum Motorcycle Length (front of front wheel to center of rear wheel)	
standard carriage	213.00 cm (84.00 in.)
extended carriage	256.54 cm (101.00 in.)
Remote Switches	remote software control

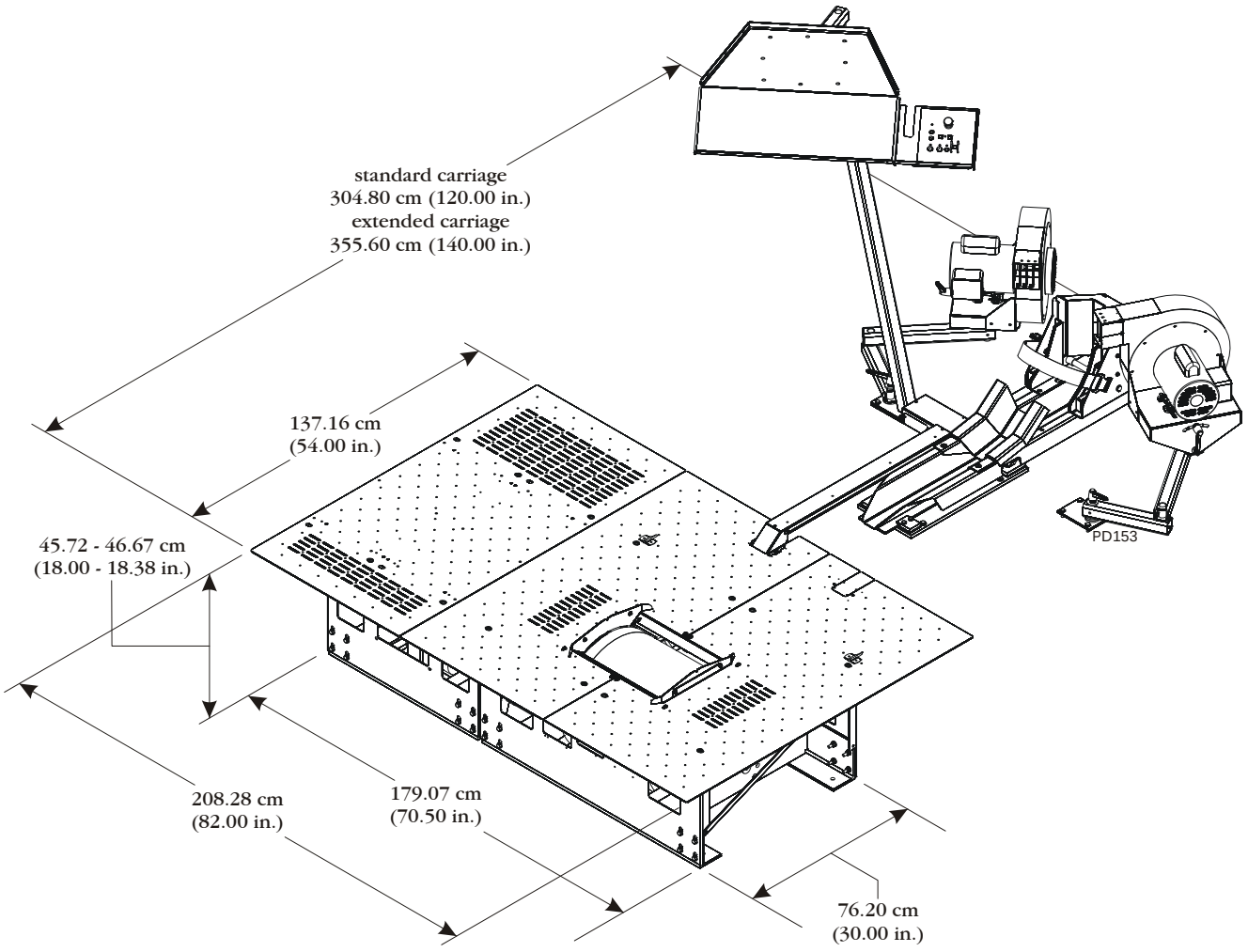


Figure 1-1: Model 250iP Dyno Dimensions

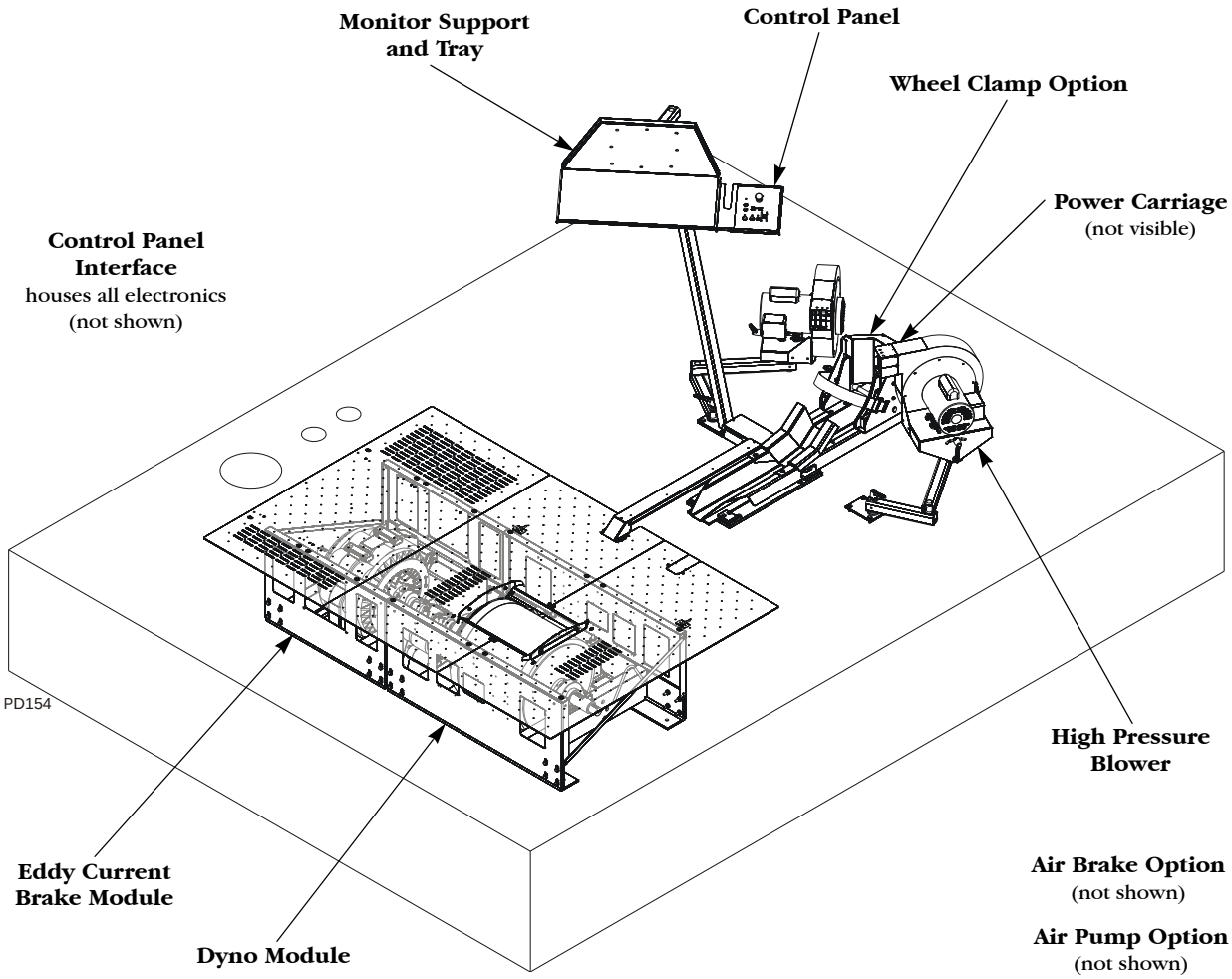


Figure 1-2: Model 250iP Dyno with Accessories

Compressed Air Requirements

The following requirements are needed when the optional air brake is included.

- regulator set to 65 psi max (450 kilopascal)
- air dryer
- shut off valve
- gauge on the regulator
- 1/4-inch NPT pipe thread connector (to attach air to the dyno)

Computer Specifications

You will need to provide a computer system to run the WinPEP software. WinPEP 7 includes complete documentation in online Help. From the WinPEP 7 menu bar, choose **Help ►WinPEP 7 Help** or visit www.winpep.com (accessible with a valid user name and password). Refer to the section on Computer Specifications in the WinPEP documentation, P/N 98118103, for the specific computer system requirements.

Drill and Drill Bit Requirements

You will need to provide a drill and drill bit capable of drilling holes in concrete. Refer to Appendix A for more information on installing Red Head Anchors.

- drill bit size: 1/2-inch
- minimum hole depth: 1 5/8-inch (41.2 mm)

Electrical Requirements

The Model 200iP/250iP dynamometers require a 240V - 30a single-phase electrical circuit for reliable and precise operation. No other loads should be plugged into these circuits and these circuits should be independent of the lighting in the dyno room. Before you plug in your dyno, you or your electrician must refer to Appendix B for detailed information.

Environmental Requirements

description	specifications
Temperature	
operating min./max	10°C/50°C (50°F/122°F)
storage min./max	0°C/60°C (32°F/140°F)
Humidity	0 to 95% non condensing

Forklift Requirements

You will need to provide equipment capable of lifting a minimum of 1,043 kg. (2300 lb.) to lift the dyno off the crate and into position in your dyno room. You will also need a pair of straps capable of supporting 1,043 kg. (2300 lb.) to attach to the dyno. Dynojet recommends using single loop style straps.

PHONE AND INTERNET ACCESS

Dynojet recommends you have a phone close to the dyno to call for assistance in an emergency. You may also wish to contact Dynojet to troubleshoot your dyno.

Internet access on your computer is desirable for contacting Dynojet and downloading new information and updates.

TIE-DOWN STRAPS

Dynojet recommends using motorcycle tie-down straps for securing the bike on the dyno. You will need to provide the tie-down straps.

DYNO ELECTRONICS

The standard dyno electronics package is comprised of four interconnected modules: Atmospheric Sensing Module, RPM Module, Dynamometer Input/Output Module, and the CPU Module. For more information refer to your WinPEP 7 User Guide (P/N 98128104).

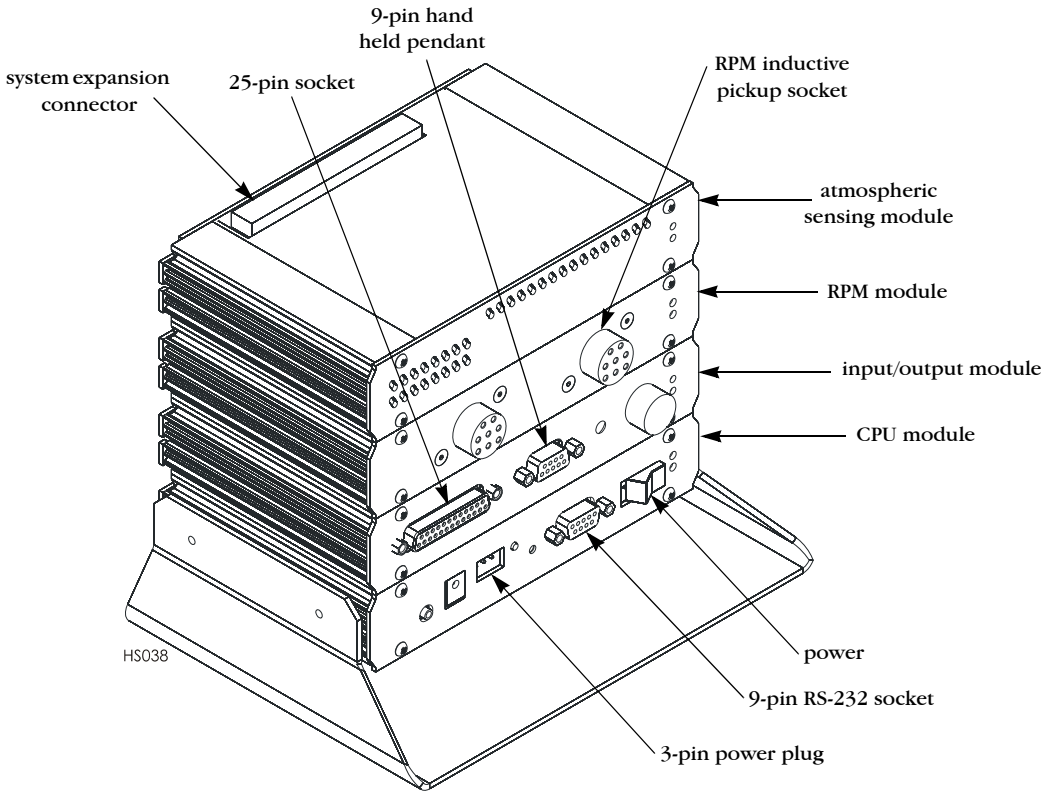


Figure 1-3: The Dyno Electronics

VERIFY THE PIT DIMENSIONS

Before placing the dyno in the pit, take a moment to verify that the dimensions of the pit are correct.

Refer to the pit dimensions (P/N 98229102) you received from your salesman for more detailed specifications.

- pit depth: 45.00 cm (18.00 in.)
- pit length: 193.00 cm (76.00 in.)
- pit width: 121.00 cm (48.00 in.)

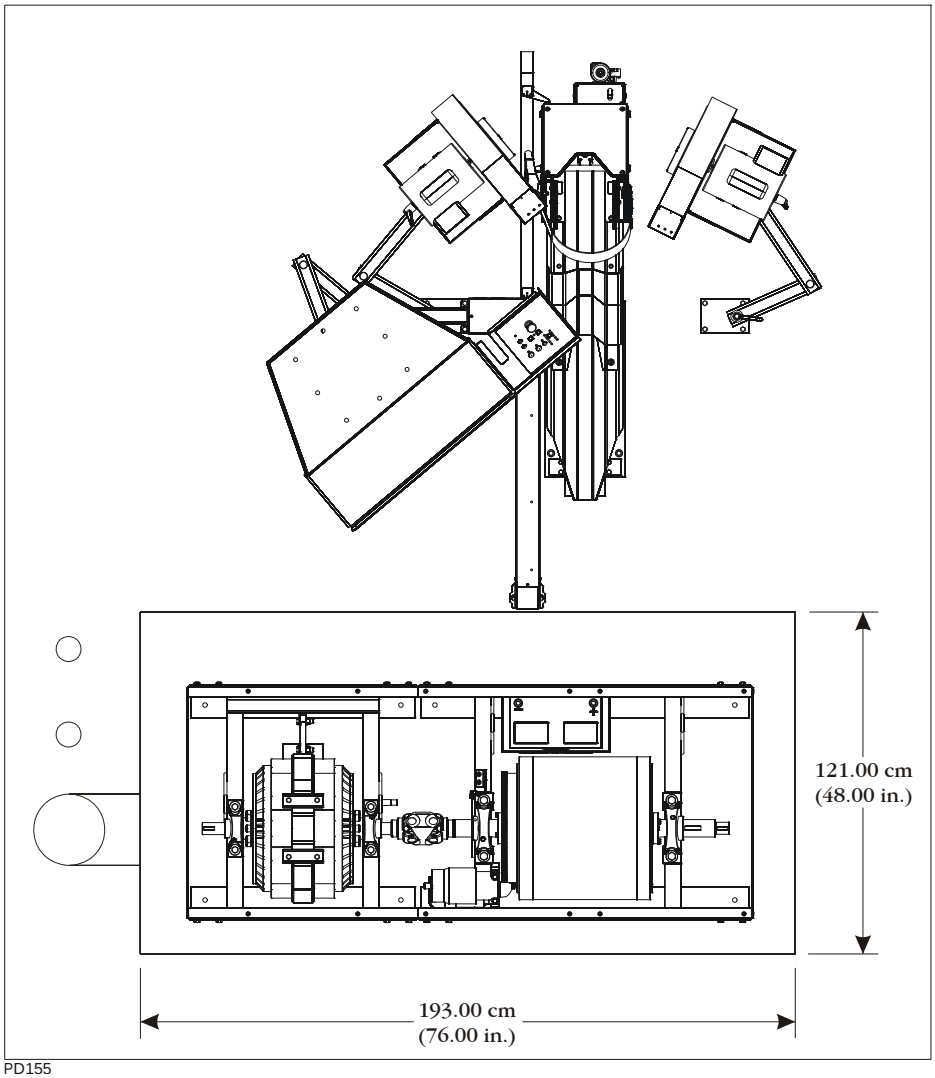


Figure 1-4: Verify the Pit Dimensions

CHAPTER

2

INSTALLATION

This chapter will walk you through unpacking and installing the dynamometer. To ensure safety and accuracy in the procedures, perform the procedures as they are described.

This chapter is divided into the following categories:

- Dyno Drum Module Installation, page 2-2
- Eddy Current Brake, page 2-10
- Secure the Drum and Brake Module to the Pit Floor, page 2-16
- Pickup Card, page 2-17
- Carriage Plate and Tire Carriage, page 2-18
- Blower and Monitor Support Installation, page 2-21
- Cable Track Installation, page 2-26
- Routing Cables, page 2-28
- Power Carriage Installation, page 2-44
- Tire Stop Installation, page 2-45
- Final Adjustments and Tests, page 2-46
- Pit Covers, page 2-48
- Junction Box Cover, Cable Cover, and End Cap, page 2-55
- Zip Tube, page 2-56

DYNO DRUM MODULE INSTALLATION

When you receive your dyno, examine the exterior of the shipping container for any visible damage. If damage is detected at this stage, contact the shipping company or Dynojet before proceeding with unpacking.

Since this manual ships inside the packing crate, you must have already cut the bands around the crate, removed the "remove by customer only" boards, and lifted the pallet containing the pit covers from the top of the crate and set it aside in order to remove the top of the crate.

It is important to follow the remaining steps carefully.

UNPACKING THE DYNO

1 Remove the crate braces, and sides.

Note: At this point you will want to inspect the exterior of the dyno for any indications of damage. Report any damage immediately.

2 Remove the tire carriage and support arm and set aside. The tire carriage and support arm are fastened to the bottom of the crate.

3 Remove the following parts, hardware boxes, the control panel interface, and accessories from the crate and set aside.

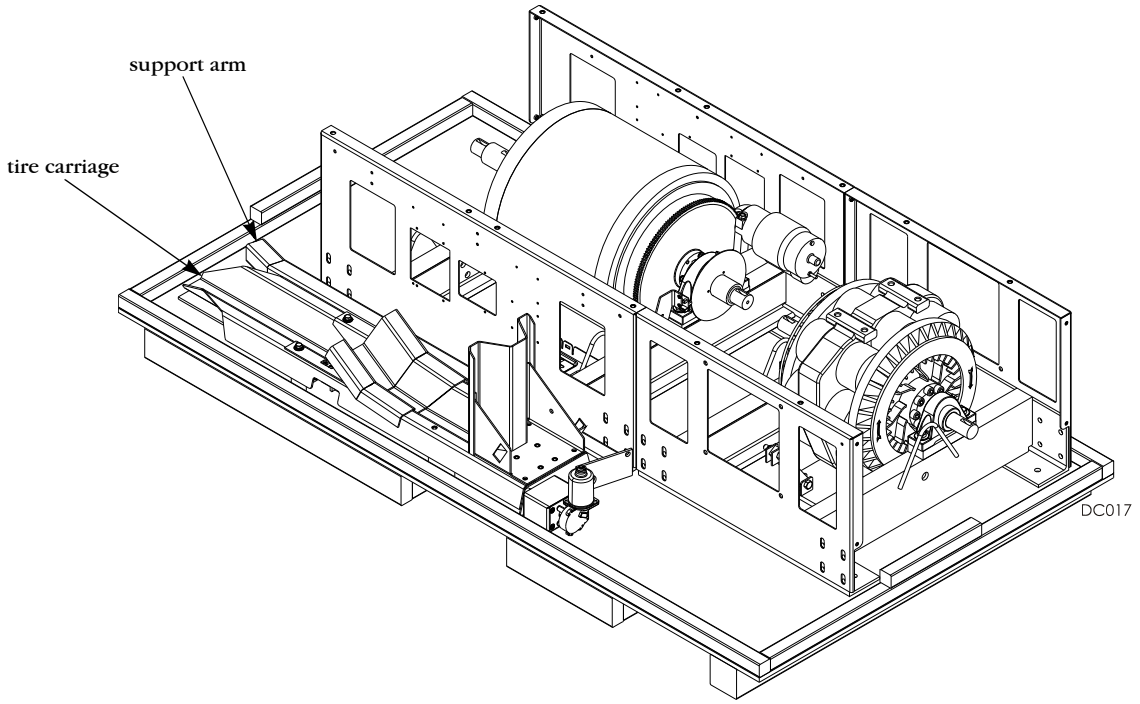
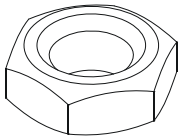
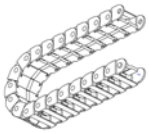
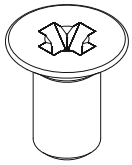
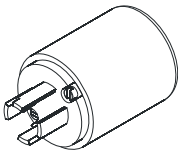
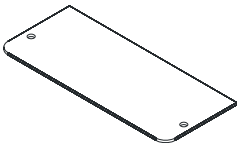
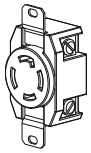
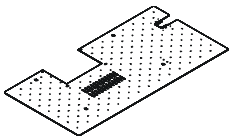
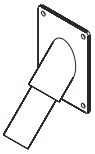
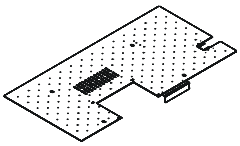
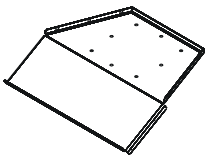
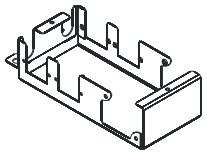
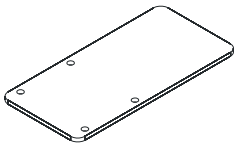
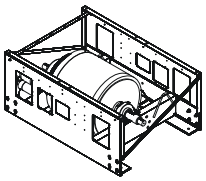
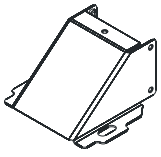
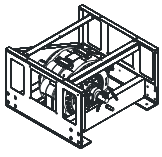
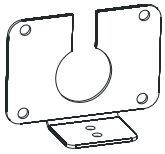
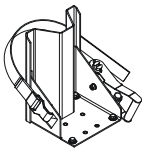
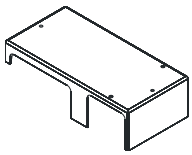
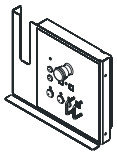
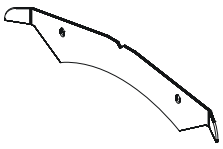
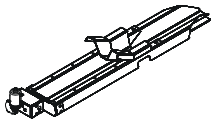
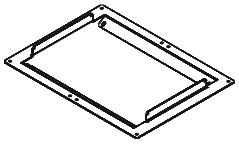
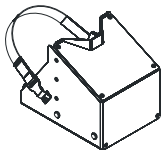
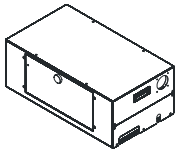
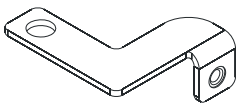
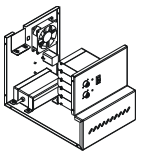
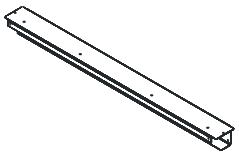
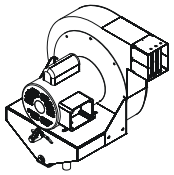
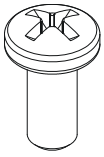
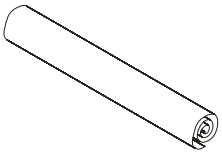
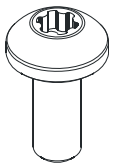
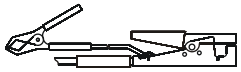
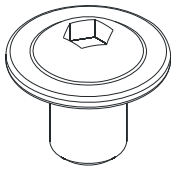
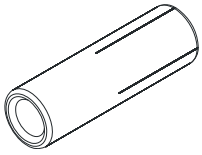
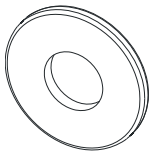
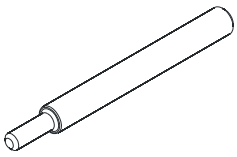
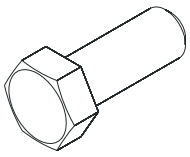
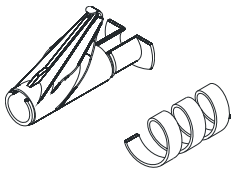
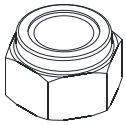
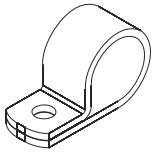
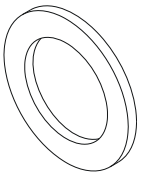
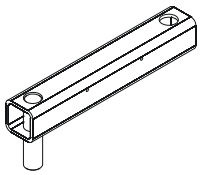
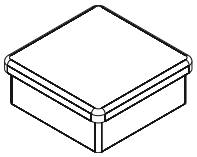


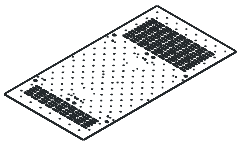
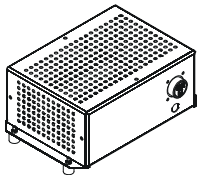
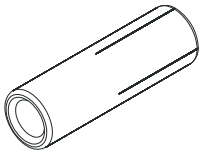
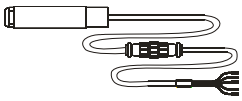
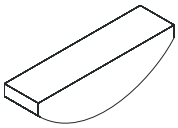
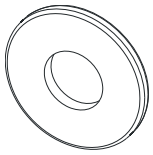
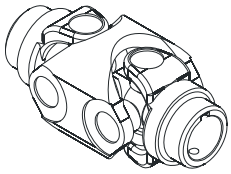
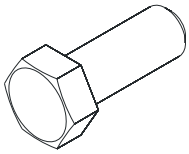
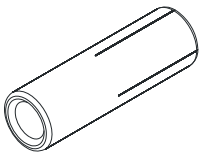
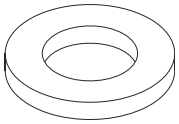
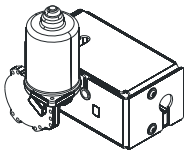
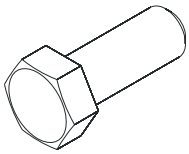
Figure 2-1: Uncrate the Dyno

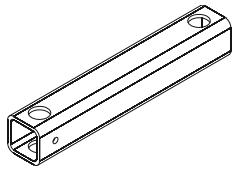
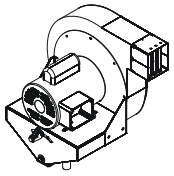
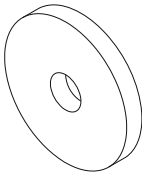
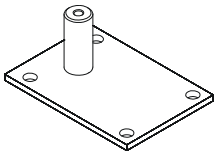
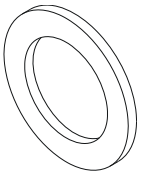
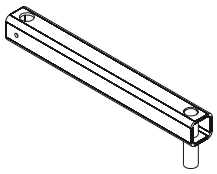
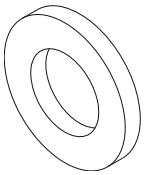
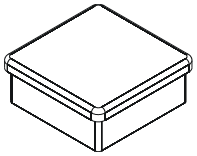
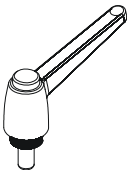
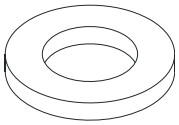
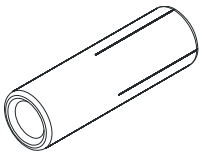
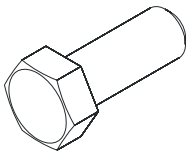
4 Verify the contents of the hardware boxes and set aside.

part	description	part	description
	nut, 4-40, hex (4) P/N 134260301		cable track P/N 43432150
	screw, 4-40 x 3/8", flat-head (6) P/N 136206141		plug, turnlok, 30A, 125/250V P/N 43816430
	blank plate, junction box P/N 21221500		receptacle, turnlok, 30A, 125/250V P/N 43826430
	pit cover, right P/N 21226104		control pod spindle assembly P/N 61329000
	pit cover, left P/N 21226105		monitor tray P/N 61329101 optional accessory
	cable junction box base P/N 21228000		monitor support P/N 61329003
	cable routing cover P/N 21228517		generic i dyno, pit P/N 62919003
	cable channel end cap P/N 21228519		eddy current brake (retarder) module, pit P/N 62919004 see parts list below

part	description	part	description
	cable hole cover track mount P/N 21228520		tire stop P/N 63310902 not included if you ordered the optional wheel clamp
	junction box cover P/N 21228521		control panel button sub-assembly P/N 66117001
	drum guard, side (2) P/N 21229111		standard carriage P/N 71323006 or extended carriage P/N 71323007 see list of parts below
	drum guard mounting bracket P/N 21624103		wheel clamp P/N 71329000 optional accessory
	cable track mounting bracket P/N 21626217		control panel interface (CPI) P/N 76129010
	cable track adapter bracket P/N 21626218		dyno electronics assembly P/N 76199001P
	cable cover, pit to junction box P/N 21626902		blower assembly P/N 76722005 optional accessory see list of parts below
	screw, 8-32 x 3/8", pan-head, phil (13) P/N 36540643		banner, dynojet (2) P/N D706

part	description	part	description
	screw, 1/4-20 x 5/8", pan-head, torx (13) P/N 36561045		inductive secondary pickup (2) P/N DE100-109S
	bolt, 3/8-16 x 1/2", button-head, flange, allen (12) P/N 36580434		inductive primary pickup clip P/N DE100-110L
	anchor, redhead, 3/8" (4) P/N 37513200		washer, 5/16", flat (4) P/N DM150-002-007
	installation tool, redhead anchor P/N 37518200		bolt, 3/8-16 x 1", hex (4) P/N DM150-019-012
	cable harness wrap kit P/N 43400000		nut, crush, 1/4-20 (4) P/N DM150-020-005
	cable clamp, 5/8" (7) P/N 43428232		
The following parts are included in the Monitor Support P/N 61329003:			
	washer, 1.87 x 1.25 ID x .12 THK (3) P/N 26215520		monitor arm (2) P/N 61329100
	cap plug, 1.75 x 1/2", Blk (4) P/N 35521420		monitor support P/N 61329500P

part	description	part	description
The following parts are included in the Retarder Module, Pit P/N 62919004:			
	pit cover, plate, retarder P/N 21226106		theta-2 controller-240V P/N 66411003 inside the power distribution stand alone
	anchor, redhead, 3/8" (2) P/N 37513200		temperature probe assembly P/N 76955001
	woodruff key, 3/8 x 1-3/8" (2) P/N 37620622		washer, 5/16", flat (2) P/N DM150-002-007
	retarder driveline assembly P/N 62240070		bolt, 3/8-16 x 1", hex (2) P/N DM150-019-012
The following parts are included in both the Standard Carriage Assembly, Pit P/N 71323006 and the Extended Carriage Assembly, Pit P/N 71323007:			
	anchor, redhead, 3/8" (4) P/N 37513200		washer, 5/16", flat (4) P/N DM150-002-007
	power carriage P/N 82943001		bolt, 3/8-16 x 1", hex (4) P/N DM150-019-012

part	description	part	description
The following parts are included in the Blower Assembly P/N 76722005:			
	lower blower arm (2) P/N 21600015		blower housing assembly (2) P/N 61328101
	washer, 3/8" metal (2) P/N 26215220		blower mount (2) P/N 61329601
	washer, 1/8" poly (4) P/N 26215520		upper blower arm (2) P/N 63413001
	washer, 1/4" poly (4) P/N 26215521		cable, high pressure blower, blower to junction box (2) P/N 76950301
	cap plug, 1.75 x 1/2", Blk (8) P/N 35521420		cable, fan power extension P/N 76950317
	clamp lever, 3/8-16 x 3/4" (2) P/N 35712991		washer, 5/16", flat (8) P/N DM150-002-007
	anchor, redhead, 3/8" (8) P/N 37513200		bolt, 3/8-16 x 1", hex (8) P/N DM150-019-012

Removing the Dyno from the Crate

This section will walk you through removing the dyno from the crate and installing the dyno in your pit.

You will need to provide equipment capable of lifting a minimum of 1,089 kg. (2400 lb.) to lift the dyno (drum module) off the crate and into position in your dyno room. You will also need a pair of straps capable of supporting 1,089 kg. (2400 lb.) to attach to the dyno. Dynojet recommends using a single loop style strap.

RECORD #

Be sure you record the dynamometer number on the inside cover of this manual.

1 Remove the four lag bolts and washers securing the drum module to the crate base using a 9/16-inch socket, open or box end wrench.
2 Wrap the single loop straps around the drum module shaft.
3 Lift the drum module off the crate and move into position in your pit.

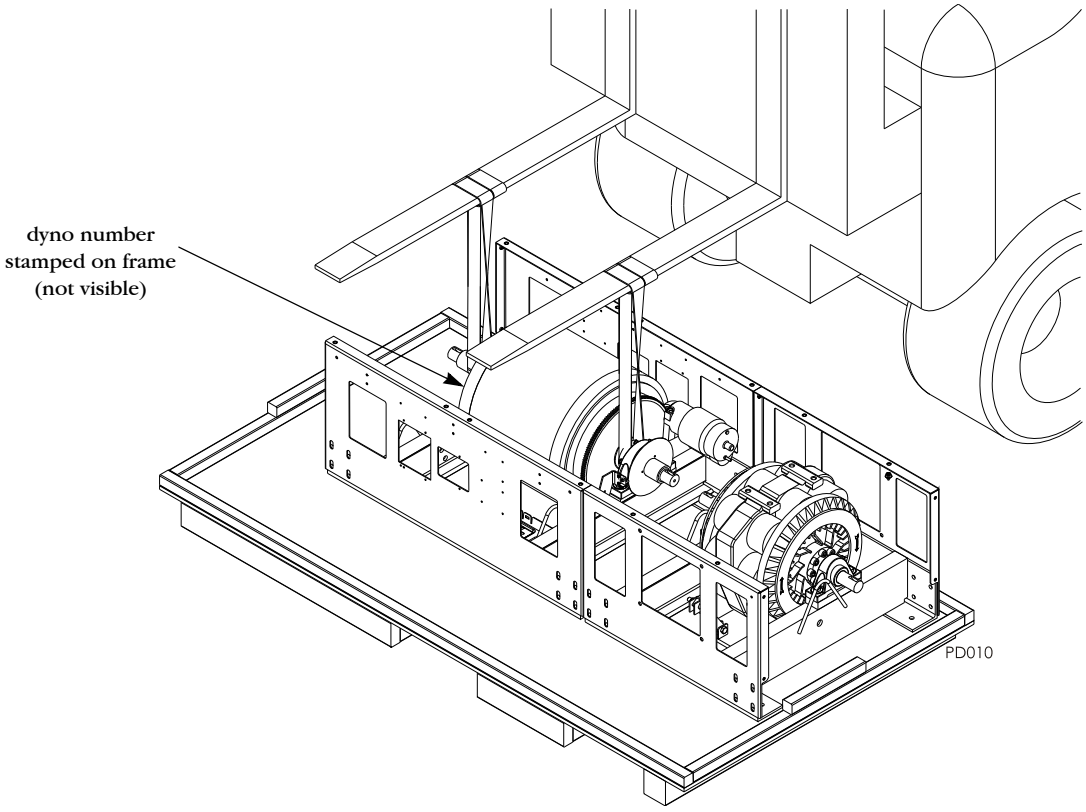


Figure 2-2: Remove the Dyno From the Crate Base

PLACING THE DYNO IN THE PIT

Place the drum module in the pit as shown.

Note: This installation has been designed for the eddy current brake to be installed on the left side of the dyno. Contact Dynojet for information regarding installation on the right.

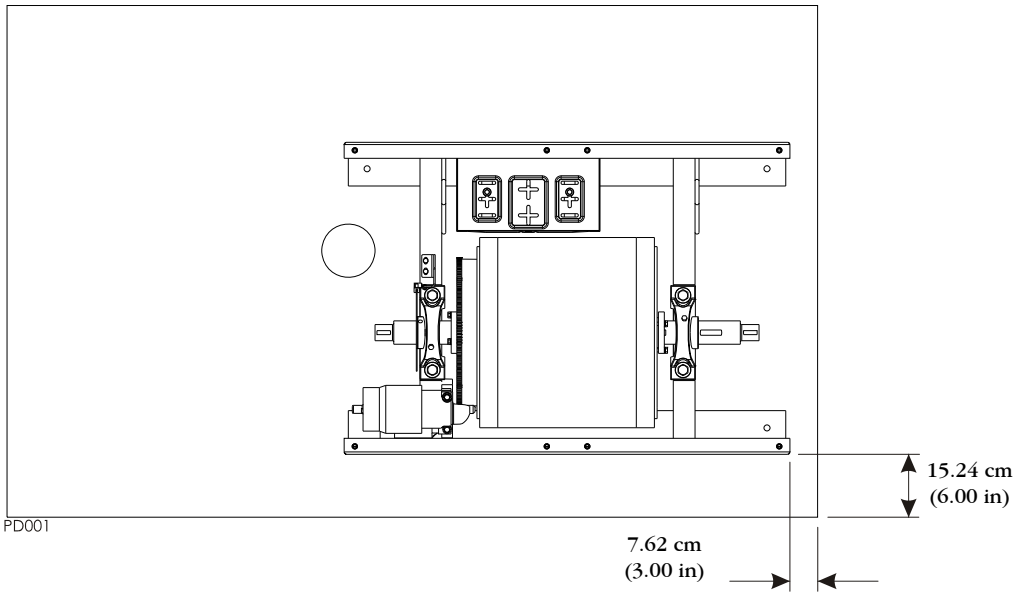


Figure 2-3: Drum Module Placement in Pit—Left Side Eddy Current Brake

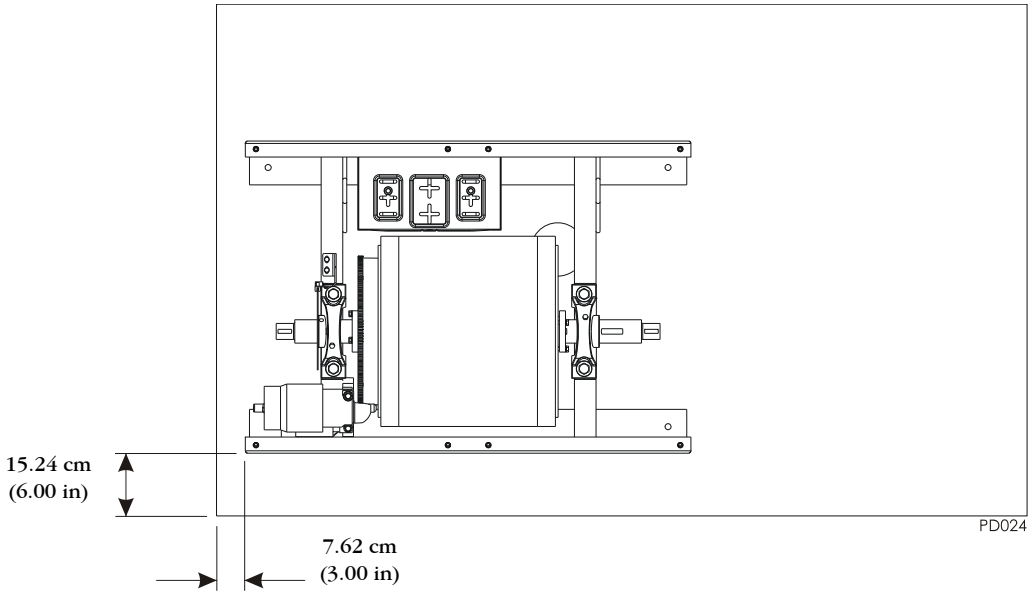


Figure 2-4: Drum Module Placement in Pit—Right Side Eddy Current Brake

EDDY CURRENT BRAKE

This section will walk you through removing the eddy current brake (or retarder) from the crate and attaching the brake to your dyno. To route and wire the temperature sensor cable and the theta controller to the Breakout board refer to “Routing the Eddy Current Brake, Battery, and Dyno Power Cables” on page 2-38 and “Wiring the Breakout Board” on page 2-42.

You will need to provide equipment capable of lifting the eddy current brake off the crate and into position in your dyno room. You will also need a pair of straps. Dynojet recommends using continuous nylon loop style straps.

To prevent possible injury, unplug all power cords and disconnect the battery.

You will need the following parts:

- 62919004 Eddy Current Brake
- 37620622 Woodruff Key, 3/8 x 1-3/8" (2)
- 62240070 Driveline Assembly

UNPACKING THE EDDY CURRENT BRAKE

1 Remove the four bolts securing the brake to the crate.

2 Remove the retarder connector plates, if present.

3 Determine if the brake is to be mounted on the left or right side of your dyno.

Note: This installation has been designed for the eddy current brake to be installed on the left side of the dyno. Contact Dynojet for information regarding installation on the right.

Make the following adjustments to the eddy current brake only if you want to mount the brake on the opposite side of the dyno that it is currently set up for.

- Move the coupler and key to the other side of the brake.

  To remove the key, use a punch and a hammer to apply pressure in the direction of the arrows shown in Figure 2-6.
- The retarder connector plates (removed in step 2) will need to be moved to the other side of the brake once the brake is installed in the pit.
- Move the temperature sensor to the other side of the brake.

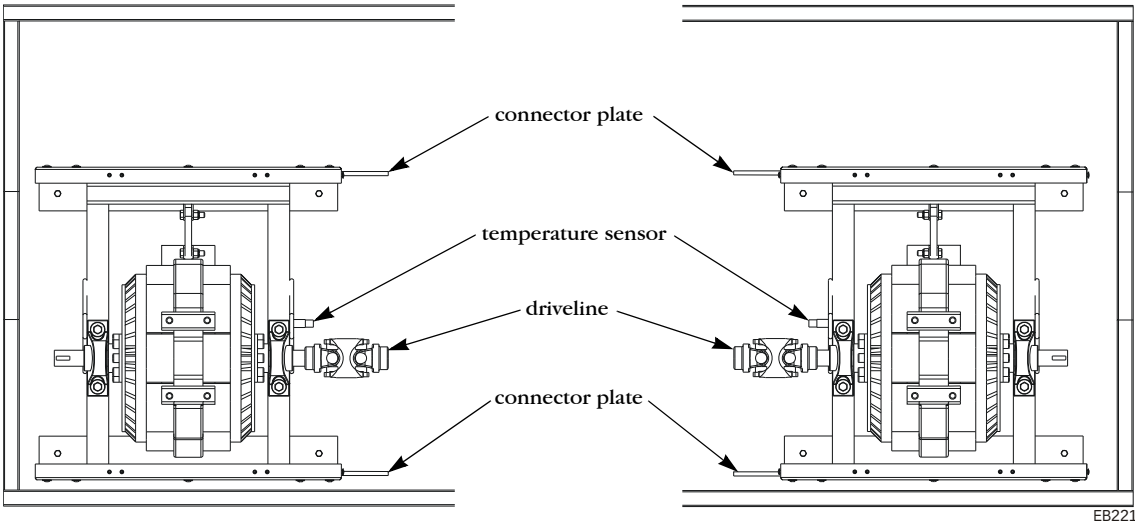


Figure 2-5: Left or Right Side Brake Set Up

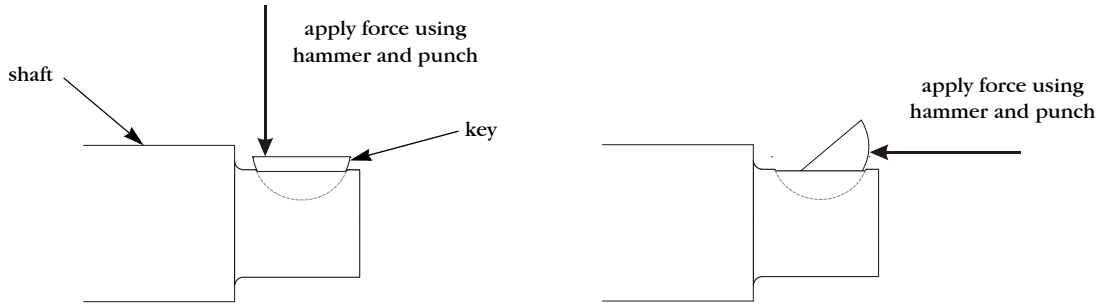


Figure 2-6: Removing the Key

4 Place the ends of a nylon loop strap through the lifting eyes on either side of the brake and hook onto the shaft.

5 Using a forklift, lift the eddy current brake from the crate and place the brake in the pit near the drum module making sure not to hit the driveline assembly.

6 Record the eddy current brake number on the inside cover of this manual.

RECORD #

Be sure you record the eddy current brake number on the inside cover of this manual.

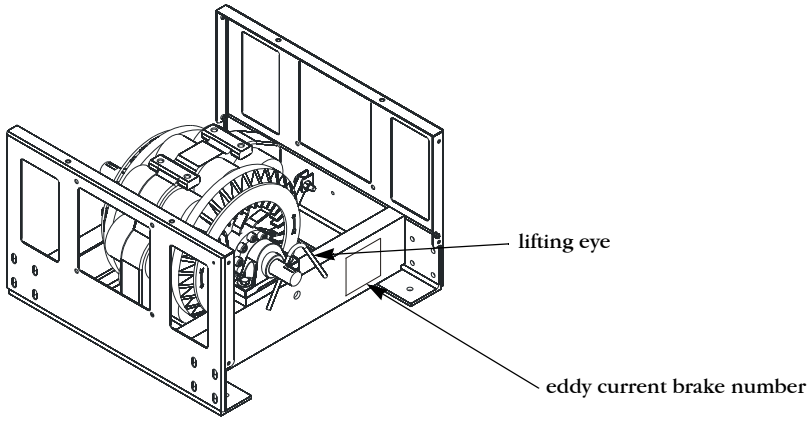


Figure 2-7: Record the Eddy Current Brake Number

INSTALLING THE EDDY CURRENT BRAKE

Safety requirements of your local country may require that both the air brake and the eddy current brake are installed. Be sure to follow the safety requirements specific to your country.

1 Insert the key into the keyway on the dyno drum module shaft.

2 Use a c-clamp to press the key in.

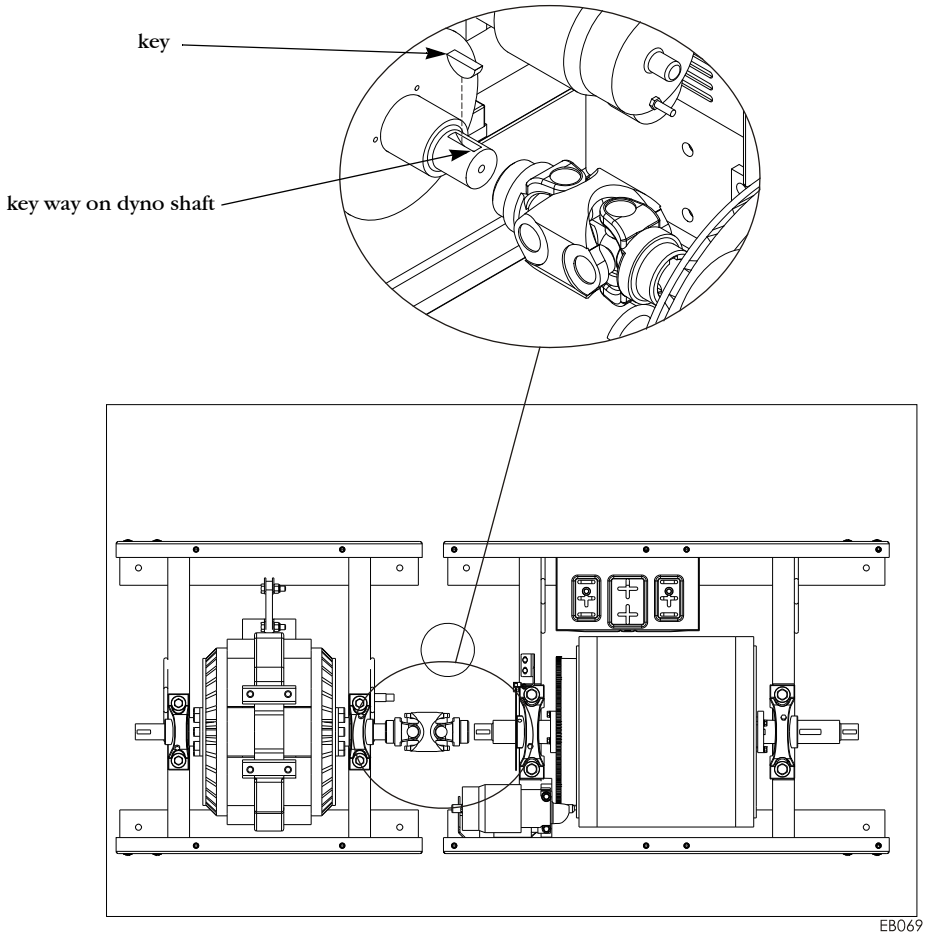


Figure 2-8: Install the Key

3 Remove the eight bolts, washers, and six nuts from the dyno frame where the connector plates will attach (where the connector plate attaches to the starter brace, there are only two nuts). Refer to Figure 2-9.

4 Remove the starter brace and set aside. Only remove the starter brace when installing the eddy current brake on the left (starter) side of the dyno.

5 Keeping the panels parallel, slide the eddy current brake towards the dyno. Slide the coupler over the key on the dyno shaft. You will need to support the coupler as you slide it onto the dyno shaft.

6 Continue sliding the eddy current brake towards the dyno until the uprights on the brake and dyno are flush.

7 Loosely secure the connector plates to the dyno frame using the eight bolts, washers, and six nuts removed earlier.

Note: Do not tighten the bolts.

8 Verify the uprights on the drum and eddy current brake modules are flush with the top of the pit floor before you tighten the connector plates.

8a Loosen all upright bolts.

8b Place two straight edges across the drum module uprights as shown.

8c With the upright tight against the straight edges, tighten the connector plate bolts and nuts on the drum module.

Note: You can use c-clamps to attach the upright to the straight edges to make this quicker. Tighten the c-clamps until the uprights are flush with the pit floor.

8d Tighten the upright bolts and nuts on the drum module.

8e Repeat this for the eddy current brake module uprights.

9 Secure the starter brace to the starter using the washer and nut removed earlier.

10 Remove the straight edges.

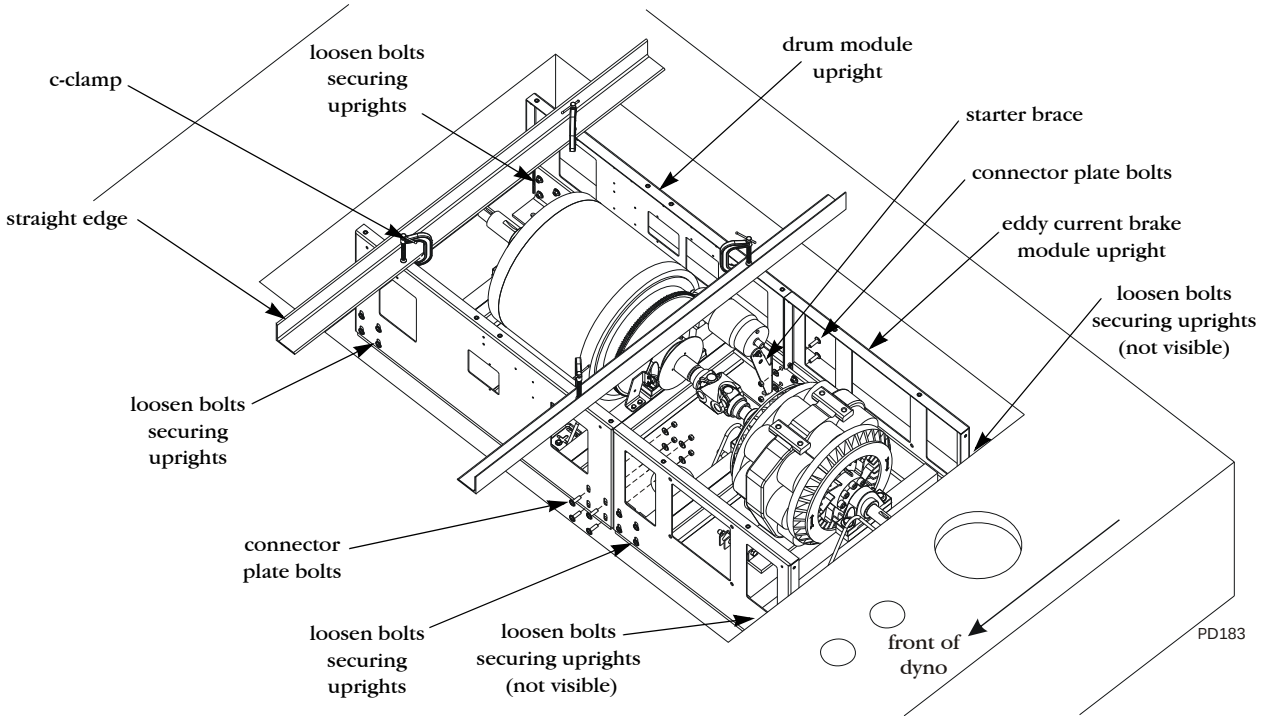


Figure 2-9: Secure the Uprights

11 Replace the existing set screws on the driveline with the thread-lock set screws provided.

12 Tighten the driveline set screws.

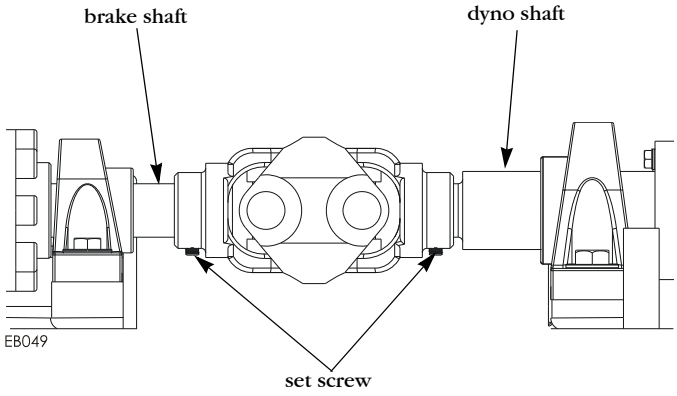


Figure 2-10: Tighten the Set Screws

SECURE THE DRUM AND BRAKE MODULE TO THE PIT FLOOR

Dynojet recommends you secure your drum and brake modules to the pit floor in your dyno room using concrete anchors. You will want to drill the holes and secure the dyno before placing the covers on your dyno.

Note: You may wish to drill the holes for the carriage mounting plate and blower mounts at this time. Refer to page 2-18 for carriage plate instructions and page 2-22 for blower mounts and support arm instructions.

You will need the following parts:

- 37513200 Anchor, Redhead, 3/8" (6)
- 37518200 Installation Tool, Redhead Anchor
- DM150-002-007 Washer, 5/16", Flat (6)
- DM150-019-012 Bolt, 3/8-16 x 1", Hex (6)

1 Mark and drill each hole needed, as shown in Figure 2-11, to secure the drum and brake modules to the pit floor.

2 Install the Red Head anchors. Refer to Appendix A for installation instructions.

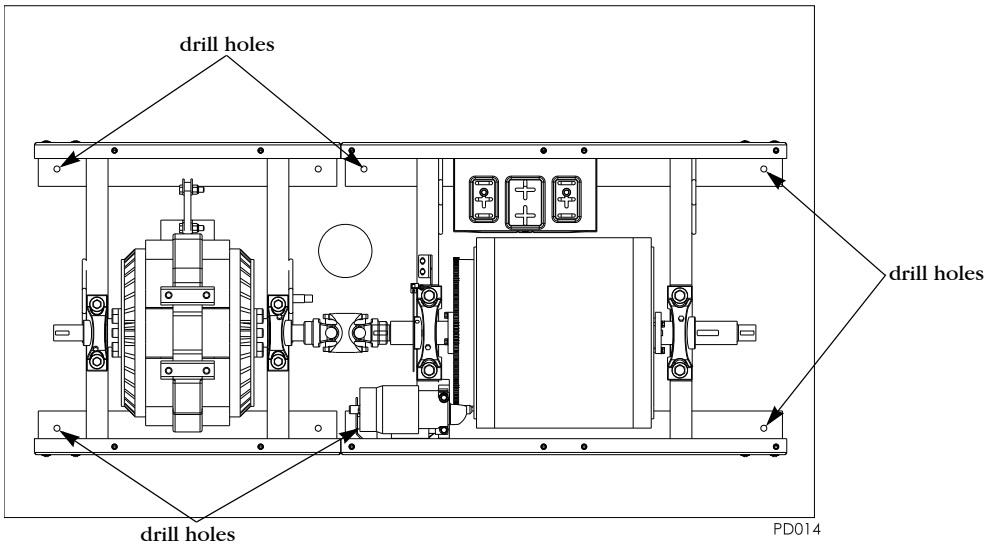


Figure 2-11: Secure the Drum and Brake Module to Pit Floor

PICKUP CARD

The pickup card is an electronic circuit board that accurately senses each drum revolution.

1 Locate the pickup card bracket on the starter side of the dyno just ahead of the drum.

2 Install the pickup card to the bracket using two No. 8 screws. Do not tighten, the card must be aligned first.

Note: If your dyno is equipped with an air brake, you will need to attach compressed air and power to your dyno before you can turn the drum.

3 Align the optical pickup card with the tab on the dyno drum axle. Be sure the tab passes freely through the optical pickup. You may need to loosen the bracket to help with alignment.

4 Once aligned, tighten the screws to secure the pickup card in place.

5 Refer to page page 2-40 for instructions on routing and connecting the pickup card cable.

CAUTION

The optical pickup is very delicate. Be careful not to damage the optical pickup during alignment.

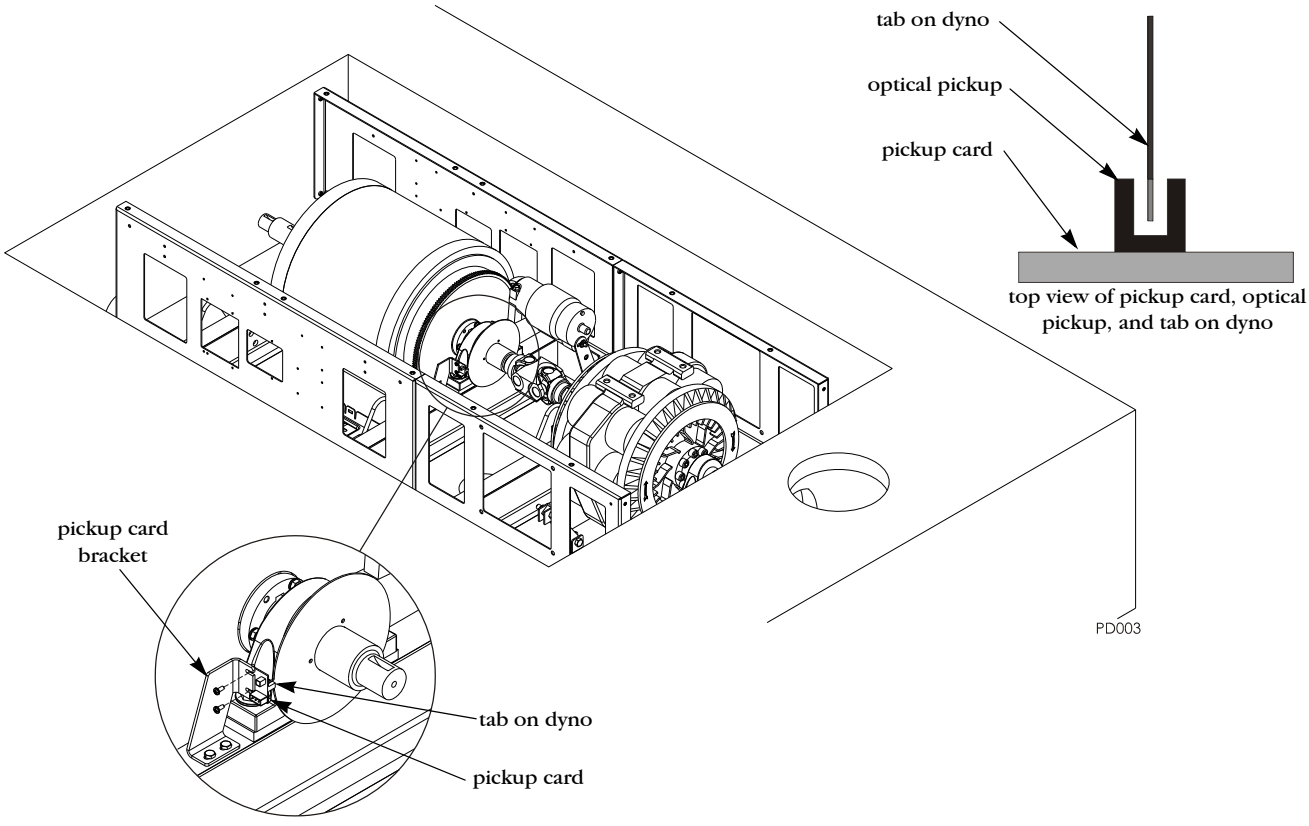


Figure 2-12: Install the Pickup Card

CARRIAGE PLATE AND TIRE CARRIAGE

Use the following instructions to install the standard carriage or optional extended carriage.

The tire carriage is fastened to the bottom of the crate next to the dyno. Refer to page 2-2 for instructions on removing the tire carriage from the crate.

You will need the following parts:

- 37513200 Anchor, Redhead, 3/8" (4)
- 37518200 Installation Tool, Redhead Anchor
- 71323006 Standard Carriage
  71323007 Extended Carriage
- DM150-002-007 Washer, 5/16", Flat (4)
- DM150-019-012 Bolt, 3/8-16 x 1", Hex (4)

INSTALLING THE CARRIAGE PLATE

1 Remove the four bearing plate screws and slide the carriage from the carriage plate.

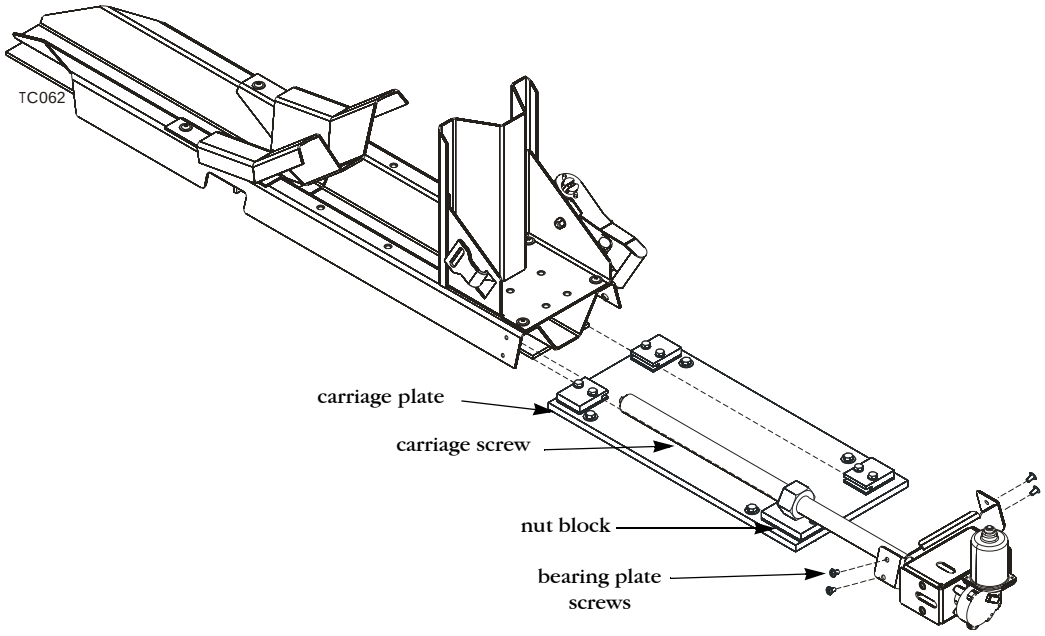


Figure 2-13: Remove the Carriage From the Carriage Plate

2 Use the carriage plate to mark and drill mounting holes as shown in Figure 2-14.

2a Using the carriage plate as a template, mark and drill four 1/2-inch holes.

2b Install the Red Head anchors. Refer to Appendix A for installation instructions.

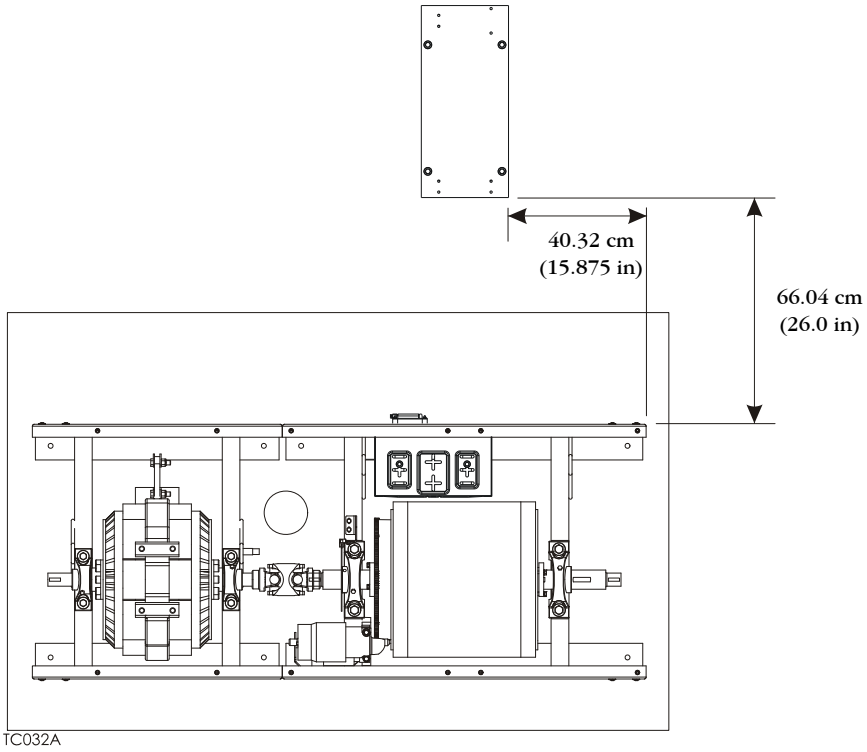


Figure 2-14: Carriage Plate Mounting Dimensions

3 Secure the carriage plate to the floor using four 3/8 x 1-inch bolts and 5/16-inch washers.

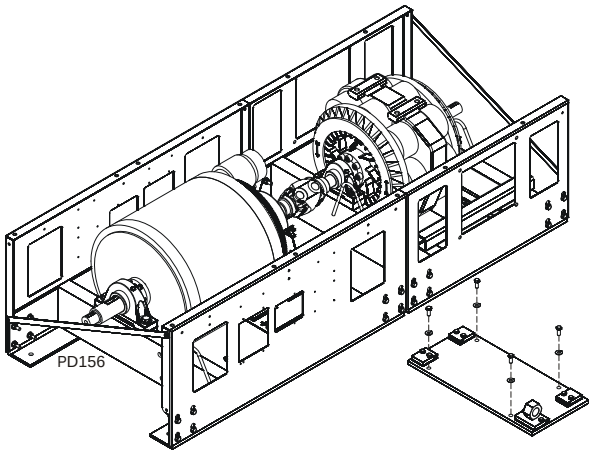


Figure 2-15: Install the Carriage Plate

INSTALLING THE TIRE CARRIAGE

1 Starting from the back of the dyno, slide the carriage under the carriage clamps.

2 Slide the carriage screw and the bearing bracket toward the nut block until the carriage screw is touching the nut block.

3 Secure the bearing bracket to the carriage using four 1/4-20 x 5/8-inch pan-head torx bolts removed earlier.

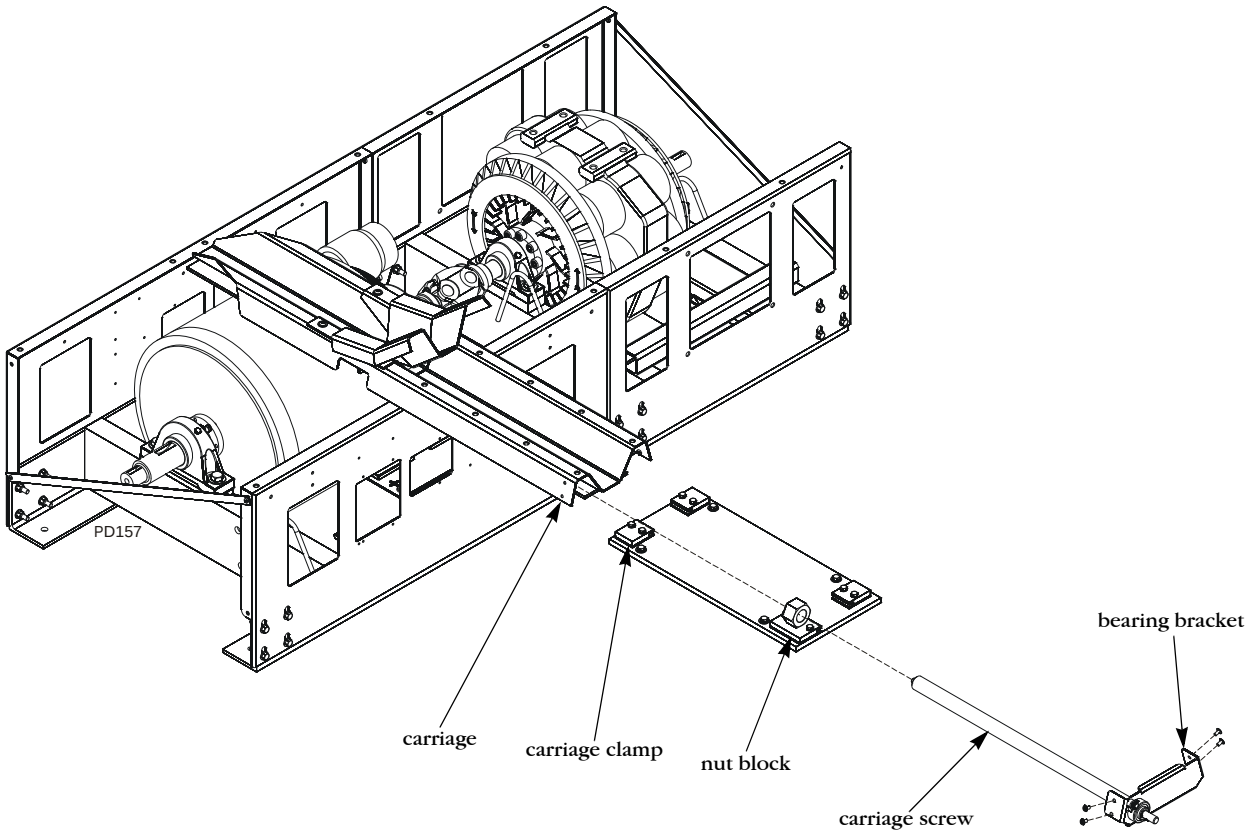


Figure 2-16: Install the Tire Carriage

BLOWER AND MONITOR SUPPORT INSTALLATION

Use the following instructions to install the blower mounts, monitor support, and junction box along with the high pressure blower assemblies and monitor tray.

You will need the following parts:

- 21221500 Blank Plate, Junction Box
- 21228000 Junction Box Base
- 61329101 Monitor Tray

The following parts are included in the Monitor Support P/N 61329003

- 26215520 Washer, 1/8", Poly (3)
- 35521420 Cap Plug (4)
- 61329100 Monitor Arm (2)
- 61329500P Monitor Support

The following parts are included in the Blower Assembly P/N 76722005:

- 21600015 Lower Blower Arm (2)
- 26215220 Washer, 3/8", Metal (2)
- 26215520 Washer, 1/8", Poly (4)
- 26215521 Washer, 1/4", Poly (4)
- 35521420 Cap Plug (8)
- 35712991 Clamp Lever (2)
- 37513200 Anchor, Redhead, 3/8" (8)
- 61328101 Blower Housing Assembly (2)
- 61329601 Blower Mount (2)
- 63413001 Upper Blower Arm (2)
- DM150-002-007 Washer, 5/16", Flat (8)
- DM150-019-012 Bolt, 3/8-16 x 1", Hex (8)

MARK AND DRILL BLOWER MOUNTS AND SUPPORT ARM MOUNTING HOLES

1 Using the carriage mounting plate and the dyno frame as reference, position the support arm and optional blower mounts as shown.

Note: The high pressure blowers are an optional accessory. If you did not order high pressure blowers, you will not need to install the blower mounts.

2 Using the mounting plates as a template, mark and drill the four 1/2-inch holes needed to secure the blower mounts and support arm to the floor.

3 Install the Red Head anchors. Refer to Appendix A for installation instructions.

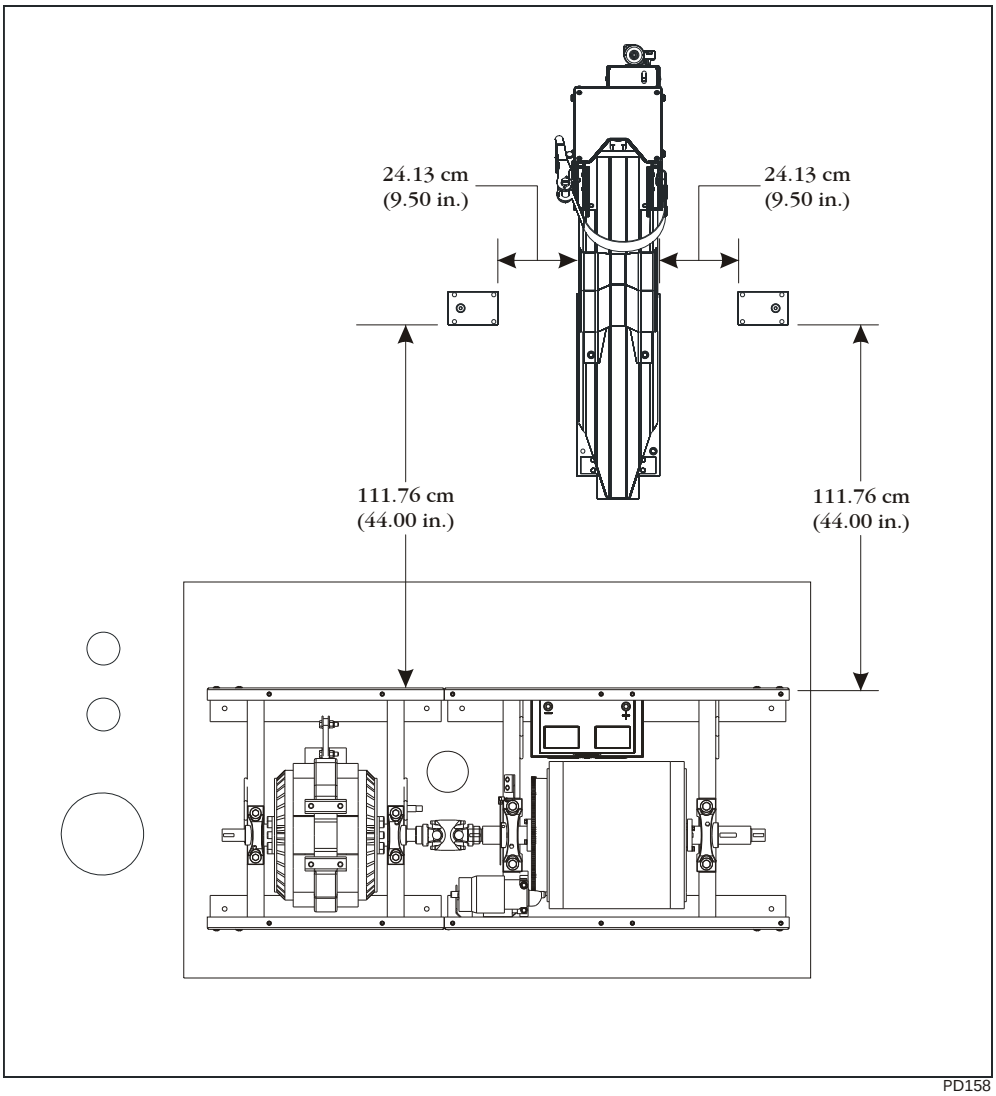


Figure 2-17: Blower Mounts and Support Arm Placement

INSTALLING THE MONITOR SUPPORT AND JUNCTION BOX

The high pressure blowers are an optional accessory. If you did not order high pressure blowers, you will not need to install the blower mounting plates. Refer page 2-21 to for high pressure blower installation instructions.

1 Secure the blower mount, monitor support arm, and junction box to the pit floor using four 3/8 x 1-inch bolts and four 5/16-inch washers.

Note: The left blower mount is secured under the support arm.

2 Secure the right blower mount to the pit floor using four 3/8 x 1-inch bolts and four 5/16-inch washers.

The high pressure blowers are an optional accessory. If you did not order high pressure blowers, you will not need to install the blower mounting plates.

3 Verify the blank plate is secured to the junction box as shown in Figure 2-18.

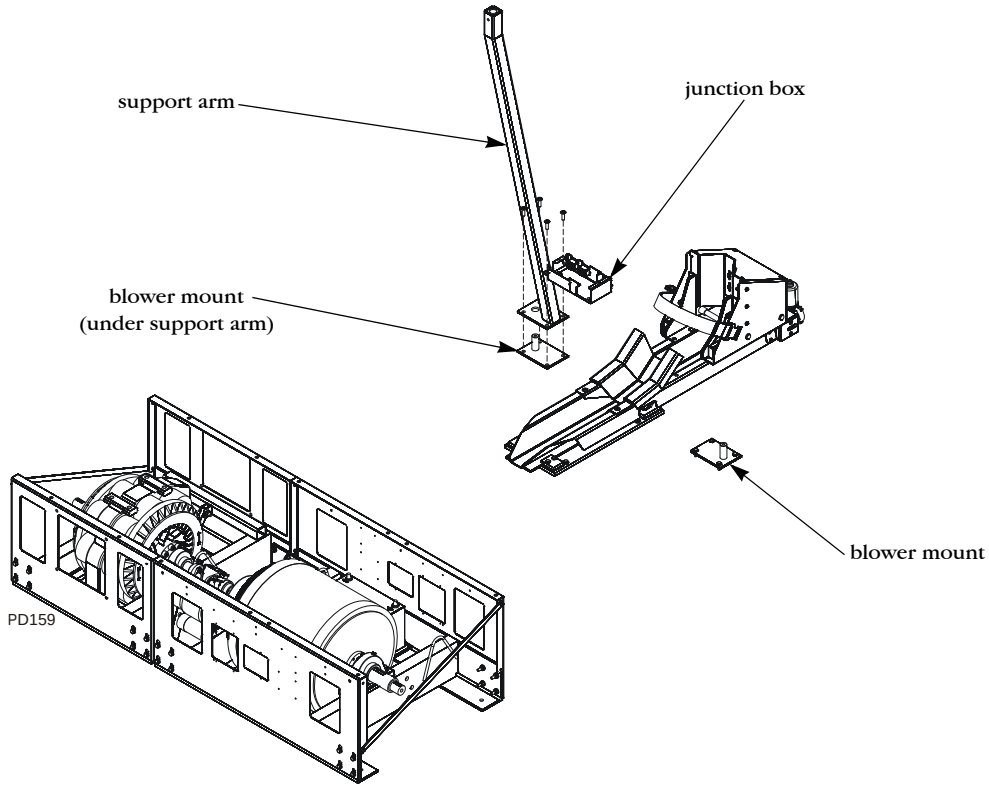


Figure 2-18: Install the Monitor Support Arm and Junction Box

INSTALLING THE BLOWER ASSEMBLIES

The high pressure blowers are an optional accessory. If you did not order high pressure blowers, skip these steps.

Use the following instructions to install both the left and right blower assemblies.

Note: Tire carriage not shown for clarity.

1 Insert a plastic cap in both ends of each arm.

2 Place two 1/4-inch thick poly washers around the pin on the blower mount.

Note: Use only one 1/4-inch thick poly washer around the pin on the left blower mount.

3 Place the lower blower arm over the blower mount pin.

4 Place a 3/8-inch thick metal washer on top of the lower blower arm.

5 Secure the lower blower arm using the clamp lever.

6 Place a 1/8-inch thick poly washer around the pin on the upper blower arm.

7 Insert the pin on the upper arm into the lower arm.

8 Place a 1/8-inch thick poly washer around the pin on the blower assembly.

9 Insert the pin on the blower assembly into the upper arm.

CAUTION

The blowers can run at any time once the cord is plugged into a power source.

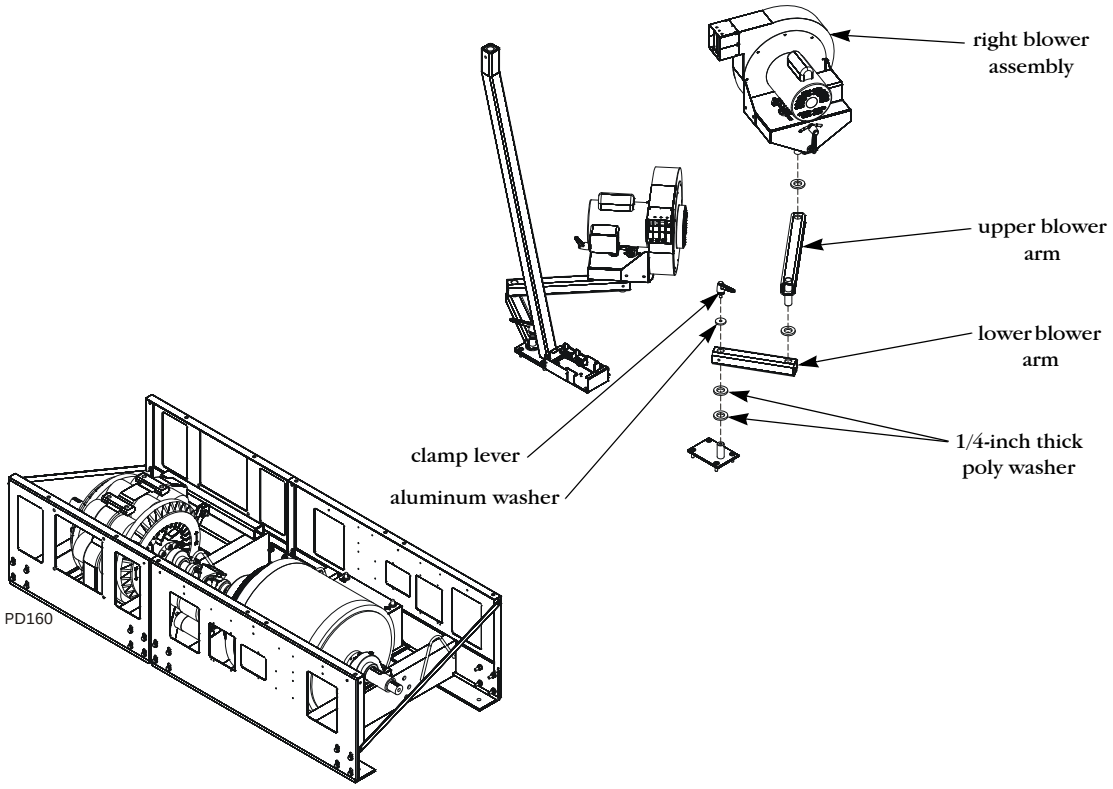


Figure 2-19: Install the Blower Assemblies

INSTALLING THE MONITOR ARMS AND MONITOR TRAY

1 Insert a plastic cap in both ends of each arm.

2 Place a poly washer around the pin of the first arm and insert the pin into the support arm.

3 Place a poly washer around the pin of the second arm and insert the pin into the first arm.

4 Place a poly washer around the pin of the tray and insert the pin into the second arm.

Note: The monitor tray is an optional accessory. If you did not order a monitor tray, skip this step.

5 Check for clearance between the monitor arm and motorcycle, walls, ceiling, etc.

Note: Dynojet does not recommend placing the computer CPU on the monitor/keyboard tray since vibration can cause damage to the computer.

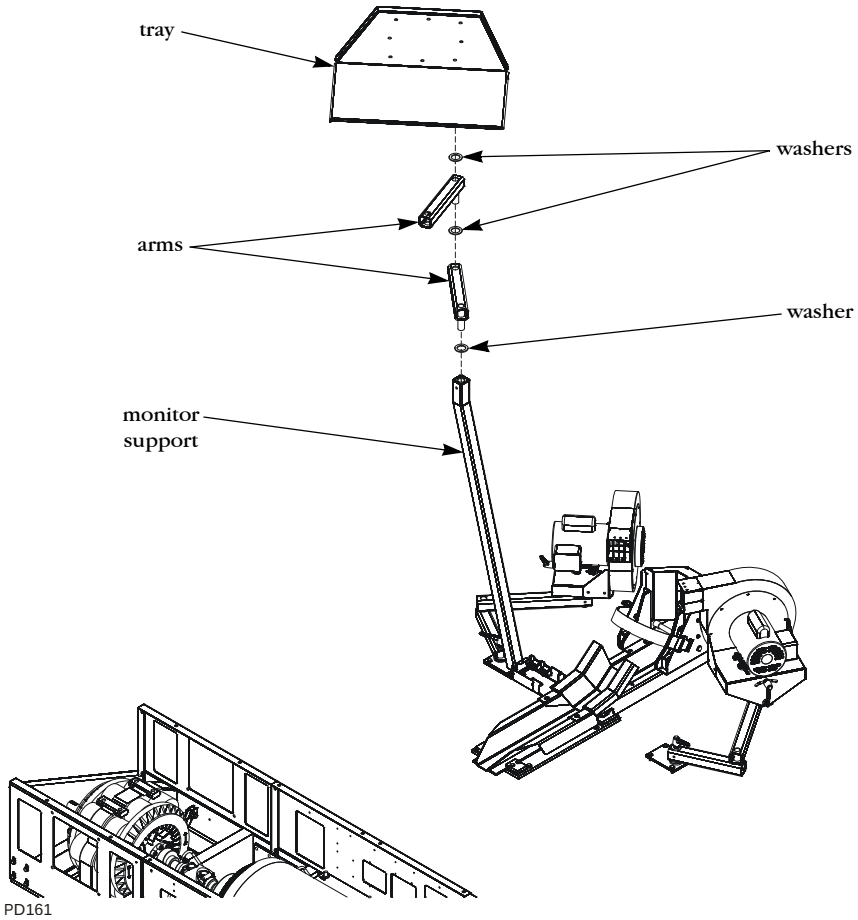


Figure 2-20: Install the Monitor Arms and Monitor Tray

CABLE TRACK INSTALLATION

You will need the following parts:

- 134260301 Nut, 4-40, Hex (4)
- 136206141 Screw, 4-40 x 3/8", Flat-Head (6)
- 21228520 Cable Hole Cover Track Mount
- 21626217 Cable Track Mounting Bracket
- 43432150 Cable Track

1 Secure the cable hole cover track mount to the junction box using two 4-40 x 3/8-inch flat-head screws.

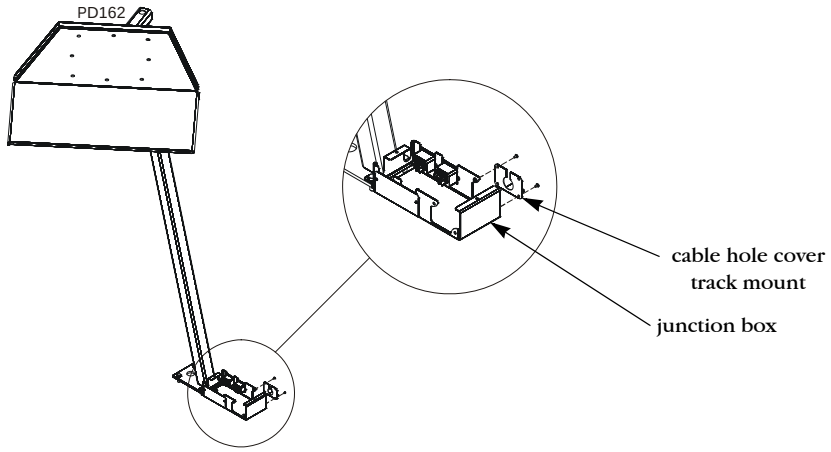


Figure 2-21: Install the Cable Hole Cover Track Mount

2 Secure the cable track to the cable hole cover track mount on the junction box using two 4-40 x 3/8-inch screws and two 4-40 nuts.

3 Secure the cable track mounting bracket to the cable track using two 4-40 x 3/8-inch screws and two 4-40 nuts.

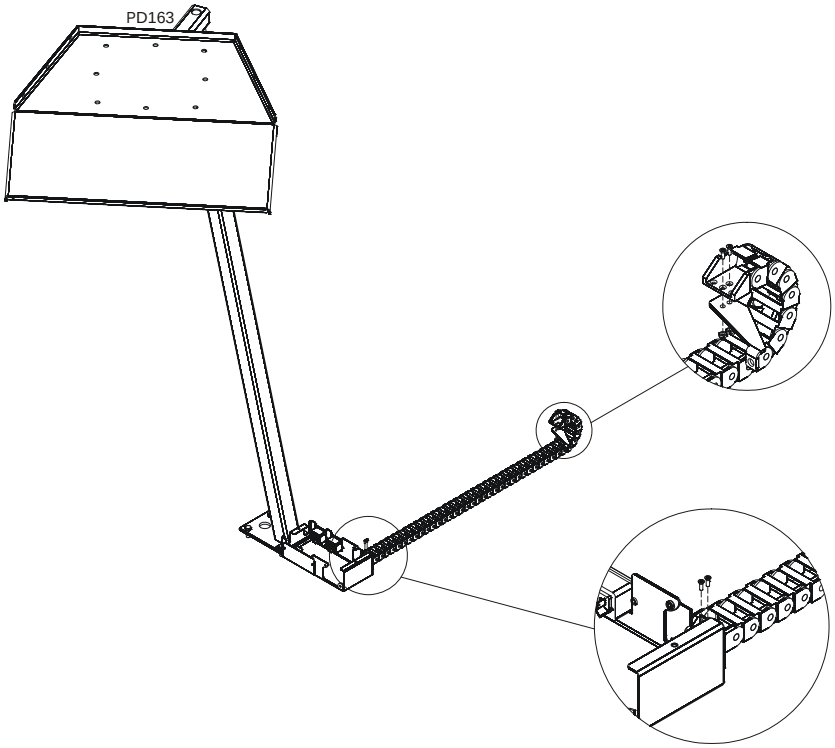


Figure 2-22: Install the Cable Track and Mounting Bracket

ROUTING CABLES

The CPI and dyno electronics must be placed near the conduits in the pit. Be sure to keep the power and communications cables in different pit conduits. For the following instructions, we will designate the pit conduits as shown in Figure 2-23.

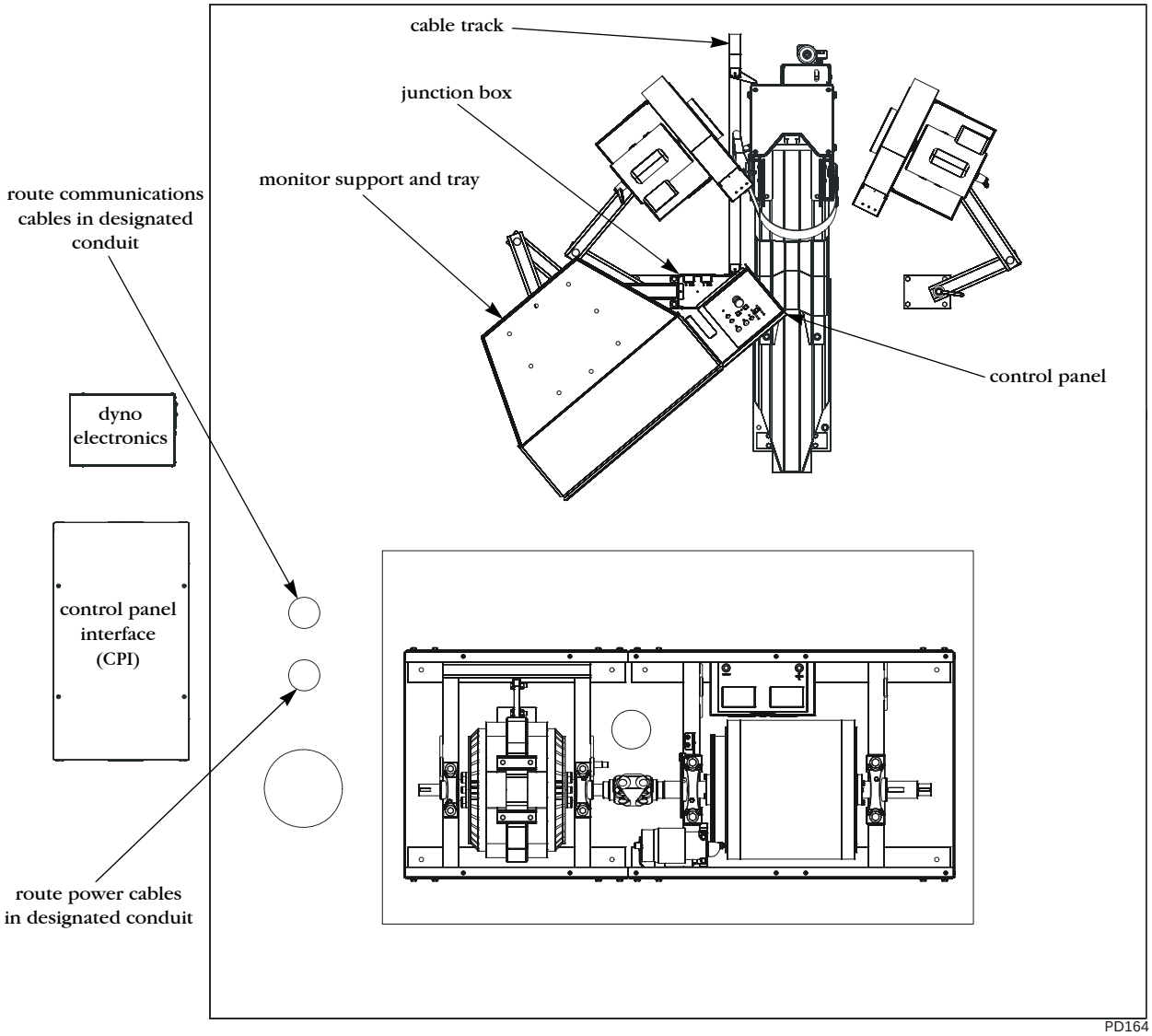


Figure 2-23: Pit Dyno Room Layout

BATTERY REQUIREMENTS

The model 200iP/250iP dyno is designed to carry a group 24 deep cycle discharge series battery for operating the starter, optional power carriage, and optional wheel clamp. The typical dimensions for this series of batteries are 10 5/8-inches long by 6 3/4-inches wide by 9 1/8-inches tall. The mounting is flexible so a battery that has dimensions close to this will work satisfactorily. The built in battery cables are configured for top post batteries. This battery is not included with your dyno. You will need to provide this battery.

The battery provides the necessary energy to run the starter, optional power carriage, and optional wheel clamp. The CPI has a built in battery charging circuit to keep the battery charged. Each time the starter, power carriage, or wheel clamp is used, this built in charging circuit will recharge the battery. The charging rate is sufficient to keep up with loading a bike, operating the wheel clamp, and adjusting the power carriage every five minutes. Recharging from use of the built in dyno starter will take longer. Do not add any external battery chargers to the car battery.

> **Note:** If you do not install the battery make sure the positive battery cable is insulated from the chassis as the charging circuit is always providing charging current whenever the dyno main power breaker is turned on.

The battery charging circuit is active anytime the main power on the dyno is turned on. If the main breaker is turned off then the battery will not be charged. Frequent use of the starter will quickly deplete the battery and it may need several hours of the internal charging to bring the battery back to a full charge.

For more information on installing the battery, refer to page 2-30.

> **Note:** If you do not wish to use the wheel clamp and the power carriage or operate the built-in starter then it is not necessary to install the battery.

USING A BATTERY CHARGER

In order to utilize the starter on dynos that do not have the Control Panel, you will need to provide an on board battery charger. A small trickle charger or battery minder is sufficient in the charging range of 1A. Verify the battery charger does not overcharge the battery when left attached.

> **Note:** Dynojet recommends using a ring connector style charger.

- Using the bolts from the battery terminals, secure the ring connectors from the charger to the battery terminals.
- Secure the charger in a safe location in the dyno.
- Route the power cable out of the dyno. Make sure the cable cannot be damaged.

These small chargers should be available from your normal distribution supply chain or other sources such as NAPA, JC Whitney, or Northern Tools.

There is danger of explosion if the battery is incorrectly replaced. Wear protective clothing, eye, and face protection when charging or handling batteries. Refer to Warnings for more information.

INSTALLING THE BATTERY

1 Secure the battery to the tray with the battery hold-down.

2 Refer to page 2-38 for instructions on routing and connecting the battery cable.

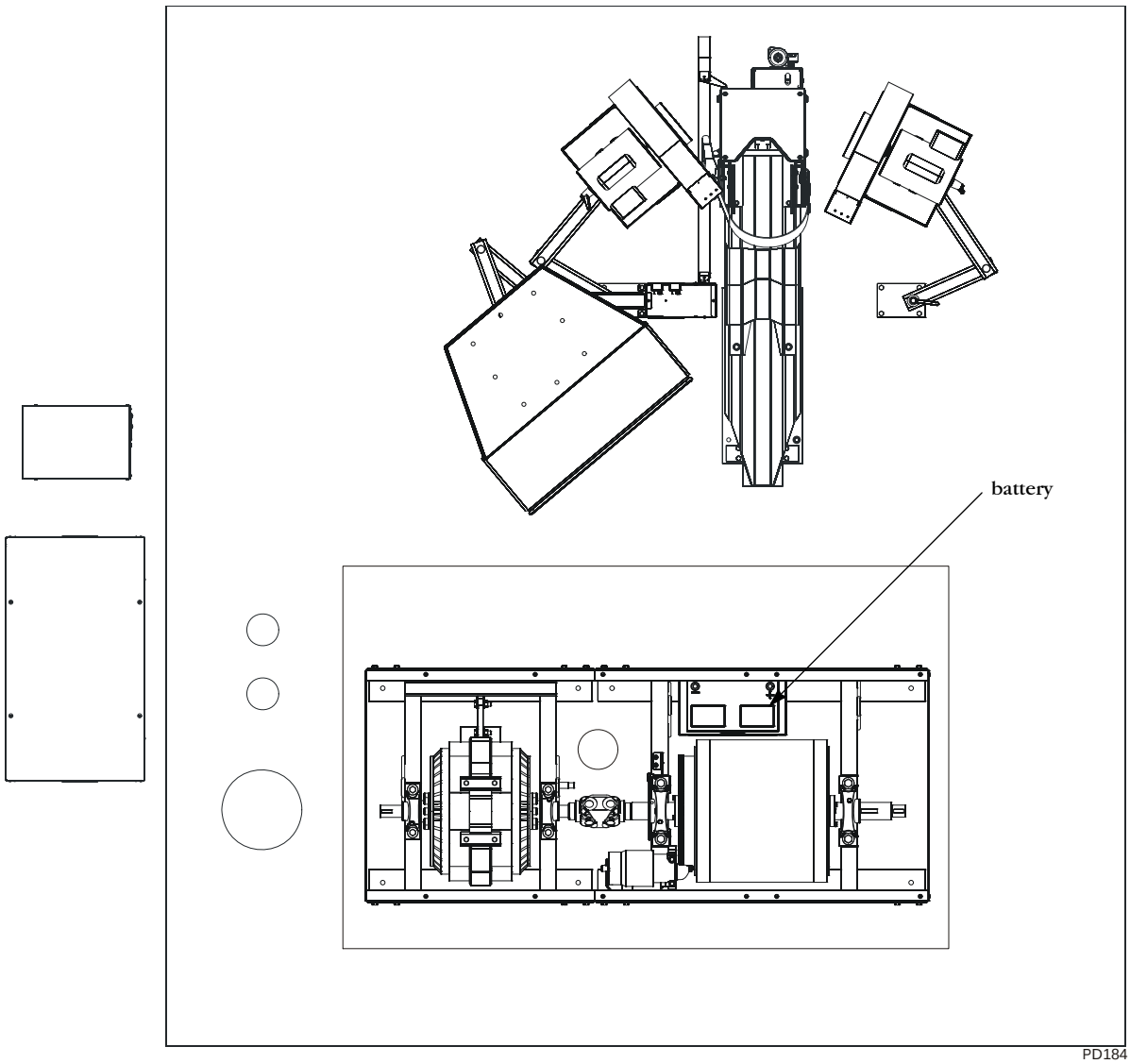


Figure 2-24: Installing the Battery

ACCESSING THE CPI

The CPI comes wired and ready to install. Should you need to re-route the cables so they come out a different side of the box, use the following instructions to access the CPI box.

1 Turn off the power to the dyno. Refer to "Main Dyno Power" on page 3-2 for more information.
2 Remove the eight button-head screws securing the cover and set aside.
3 Remove the cover and set aside.
4 Open the front panel to access the breakers and Breakout board.

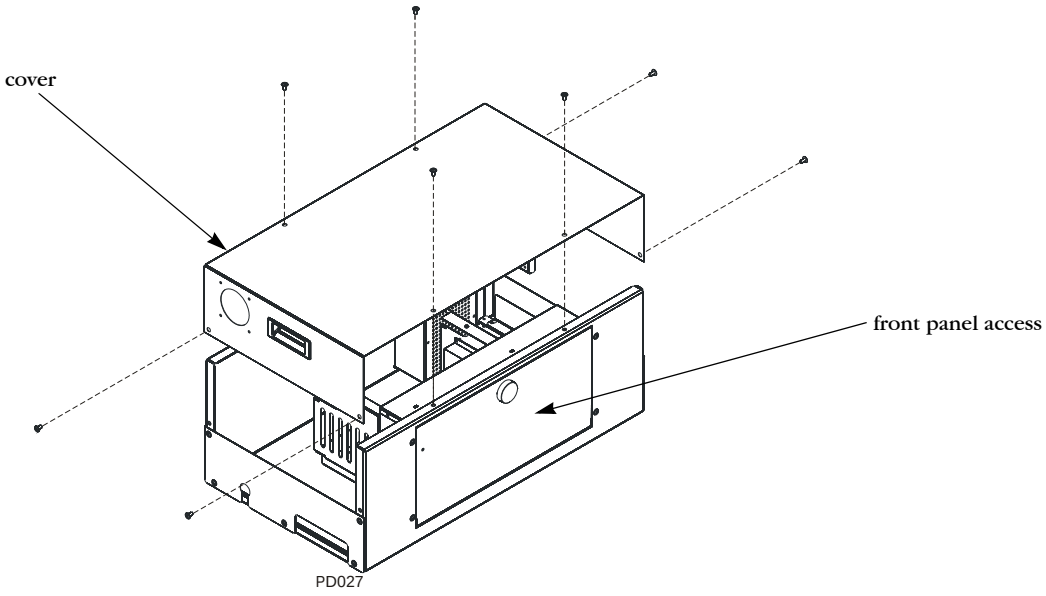


Figure 2-25: Accessing the CPI

ROUTING THE CONTROL PANEL AND PENDANT CABLES

1 Route the control panel cable (P/N 76951502) from the CPI through the designated communications pit conduit, through the pit, and out of the pit as shown.

2 Route the pendant cable from the dyno electronics input/output module through the same conduit and along the same path as the control panel cable. Refer to "Dyno Electronics" on page 1-10.

Note: Be sure to keep the power and communications cables in different pit conduits.

3 From the pit, route the cables through the junction box.

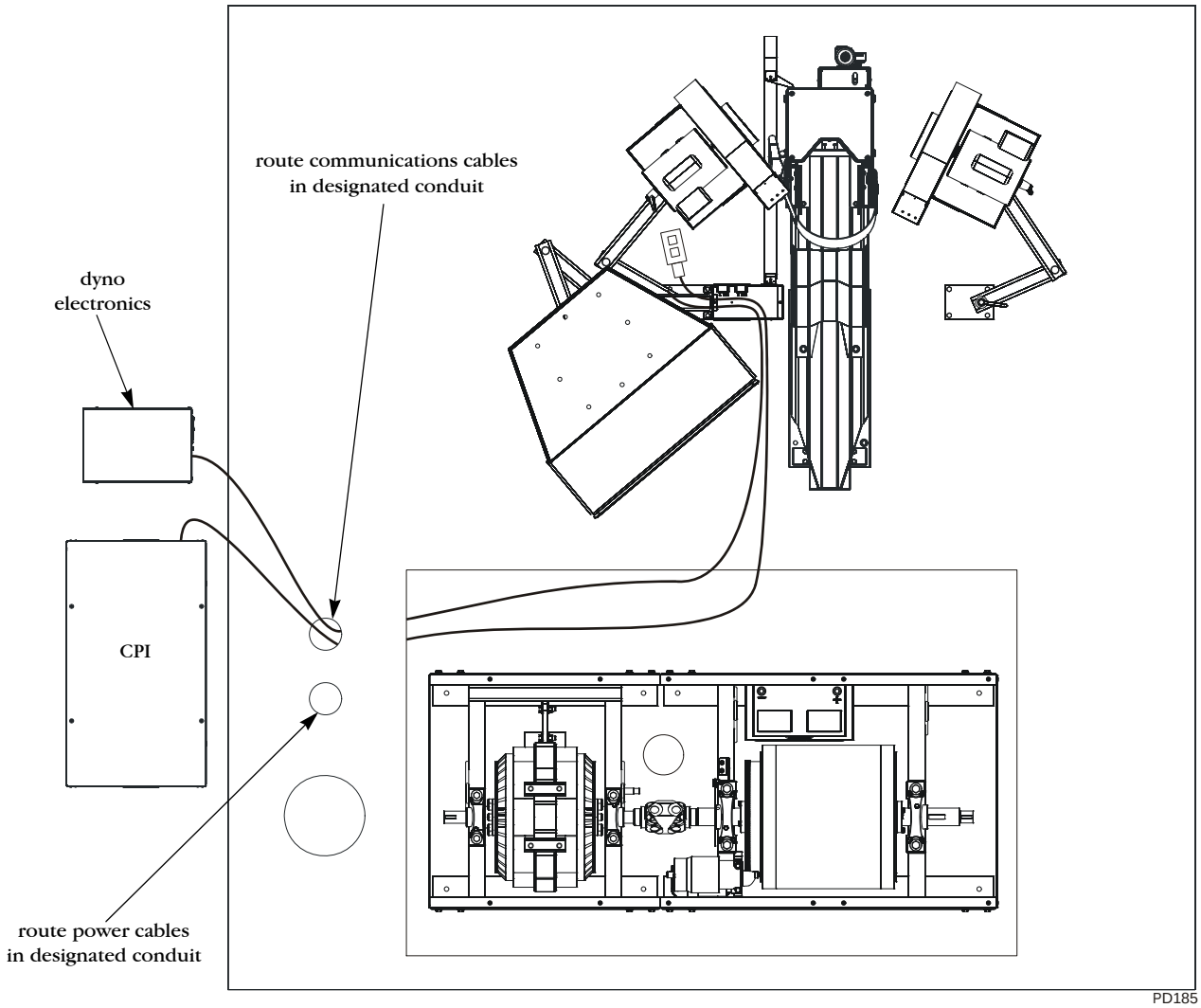


Figure 2-26: Route the Control Panel and Pendant Cables

4 Remove the control panel rear cover.
   4a Remove the two nuts from the top of the cover and set aside.
   4b Remove the screw on the top of the cover and set aside.
   4c Remove the screw on the side of the cover and set aside.
   4d Remove the four screws on the back of the cover and set aside.
   4e Remove the control panel rear cover and set aside.

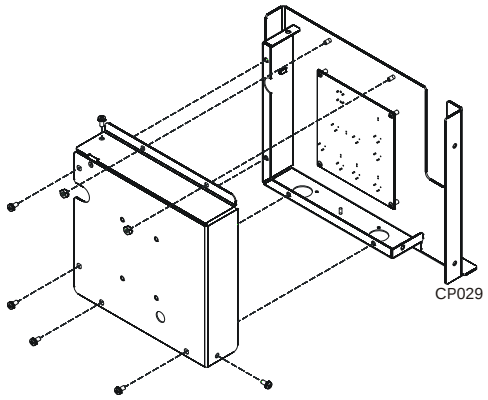


Figure 2-27: Remove the Control Panel Rear Cover

5 Route the control panel cable through the access hole on the side of the control panel box and through the cable tie.
6 Attach the control panel cable to the Button board.

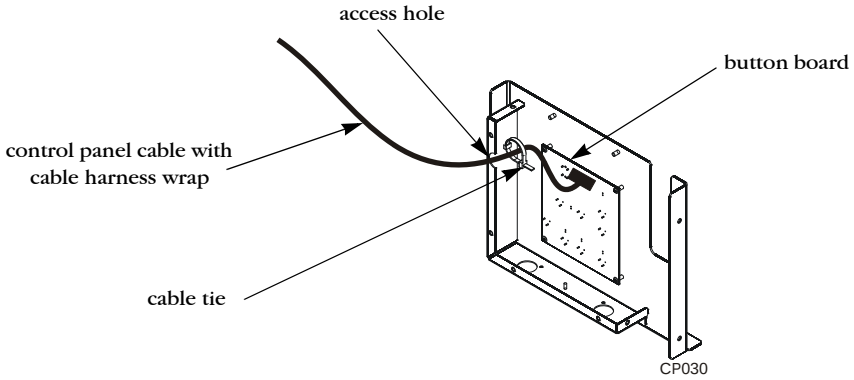


Figure 2-28: Attach the Control Panel Cable to the Button Board

7 Tighten the cable tie.

8 If you purchased the optional air brake, install the Emergency Stop Sticker at this time. Refer to page 3-5 for directions.

9 Secure the rear cover to the control panel.

9a Replace the four screws on the back of the cover removed earlier.

9b Replace the screw on the top of the cover removed earlier.

9c Replace the screw on the side of the cover removed earlier.

9d Replace the two nuts removed from the top of the cover removed earlier.

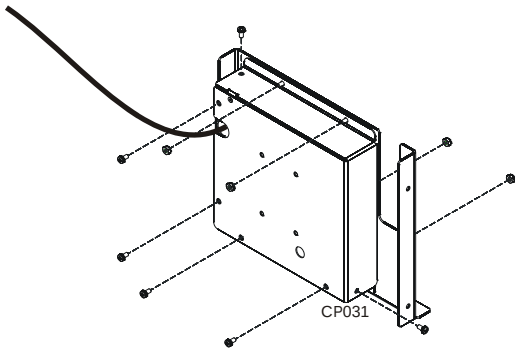


Figure 2-29: Replace the Control Panel Rear Cover

10 Secure the control panel to either side of the monitor tray using two 8-32-inch screws.

Note: If you did not order a monitor tray, you will need to install the control pod spindle on the bottom of your control panel using four 8-32 screws as shown in the detail in Figure 2-30. Once installed, place the pin on the control panel into the support arm where the monitor tray is.

11 Place the pendant in the slot on the control panel.

Note: If you plan on routing your cables through a zip tube refer to “Zip Tube” on page 2-56 and skip the following steps.

12 Route the cable bundle along the support arms with service loops to allow movement as shown below.

13 Using the provided cable clamps and 8-32-inch screws, attach the cable bundle to the arms and the support arm. Adjust the service loops to allow for easy movement of the monitor arms without pulling on the cables.

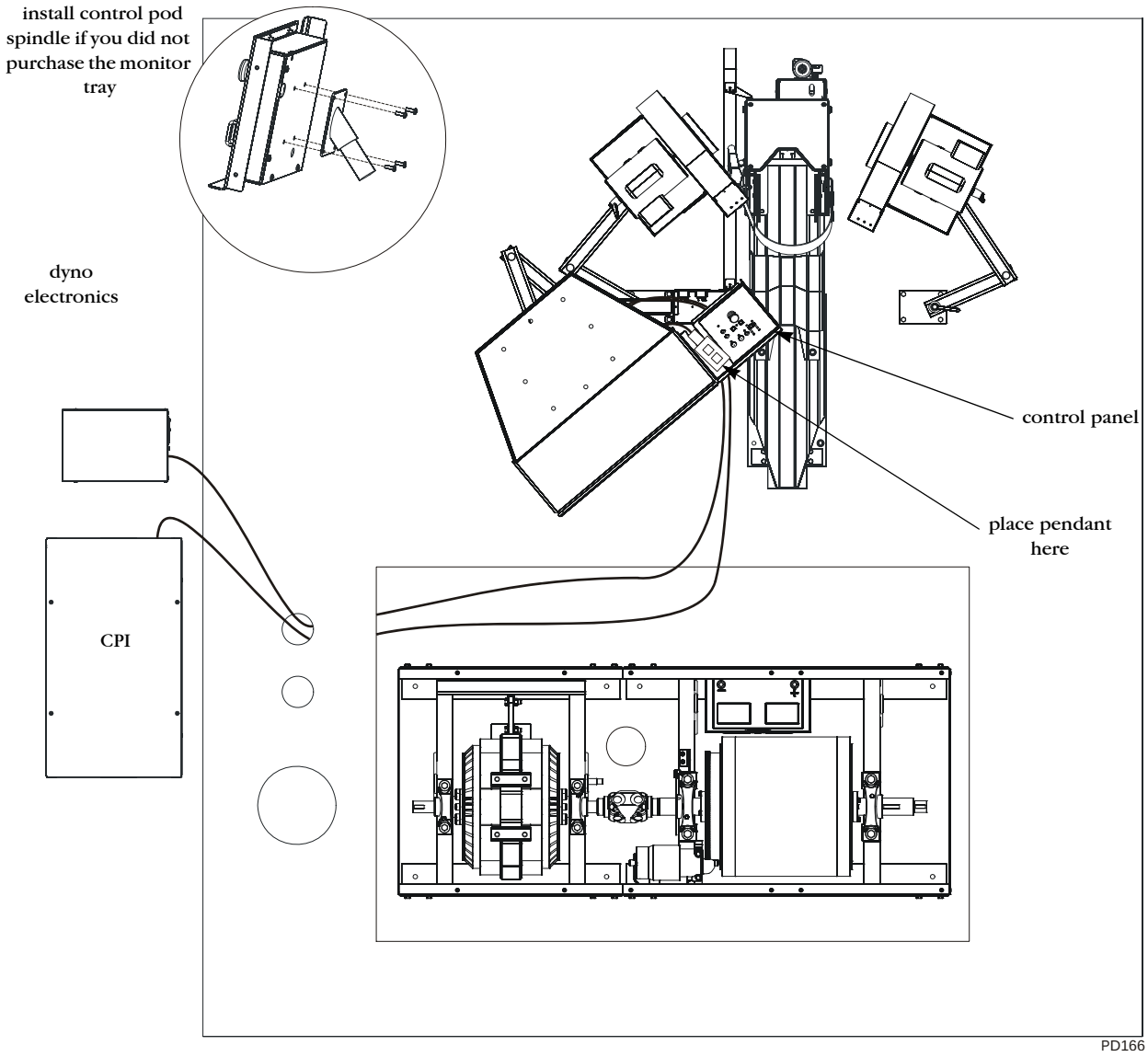


Figure 2-30: Install the Control Panel

ROUTING THE HIGH PRESSURE BLOWER CABLES

The high pressure blowers are an optional accessory. If you did not order the high pressure blowers it is still necessary to route the blower cables to the junction box.

1 Route each blower cable (P/N 76950315) from the CPI through the designated power pit conduit, through the pit, and out of the pit as shown.

Note: Be sure to keep the power and communications cables in different pit conduits.

2 From the pit, route both cables into the junction box.

3 Attach the two blower connectors to the junction box using 4-40 screws.

Note: The blower connectors are attached to the blower cables.

4 Connect the cables from each blower to the connectors on the junction box.

Note: There is an extension cable (P/N 76950317) for the blower furthest from the junction box. Plug the power cord from this blower into the supplied blower extension cable and into the power source located at the junction box.

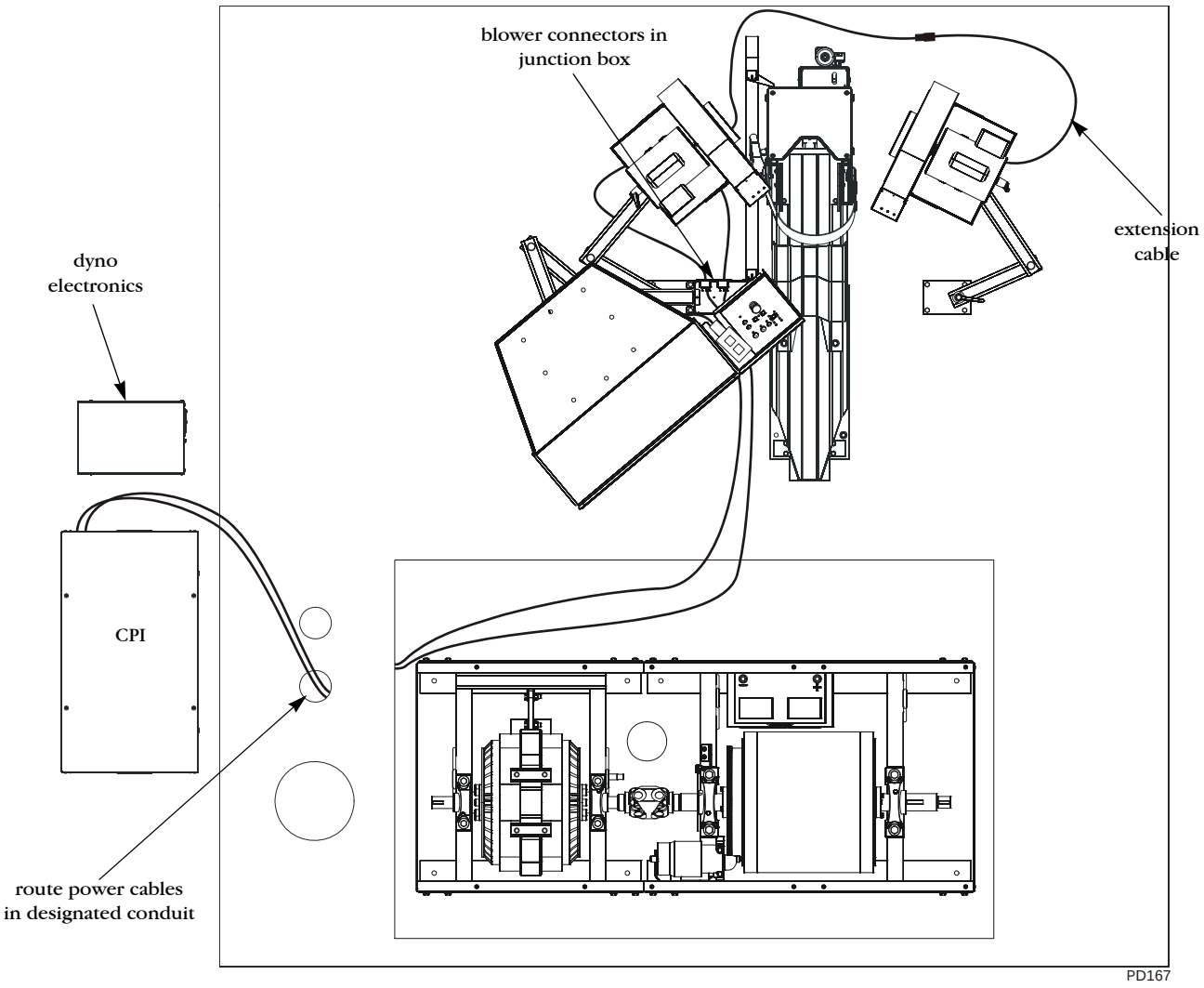


Figure 2-31: Route the High Pressure Blower Cables

ROUTING THE POWER CARRIAGE AND WHEEL CLAMP CABLES

The wheel clamp is an optional accessory. If you did not order this accessory, it is still necessary to route the cables to the junction box. After you install the wheel clamp you can finish routing the cables, refer to "Wheel Clamp" on page 3-17 for installation instructions.

1 Route the power carriage cable (P/N 76950314) from the CPI through the designated power pit conduit, through the pit, and out of the pit as shown in Figure 2-32.

2 Route the wheel clamp cable (P/N 76950313) from the CPI through the same conduit and along the same path as the power carriage cable.

Note: Be sure to keep the power and communications cables in different pit conduits.

3 From the pit, route both cables through the junction box.

4 Press each cable into the cable track.

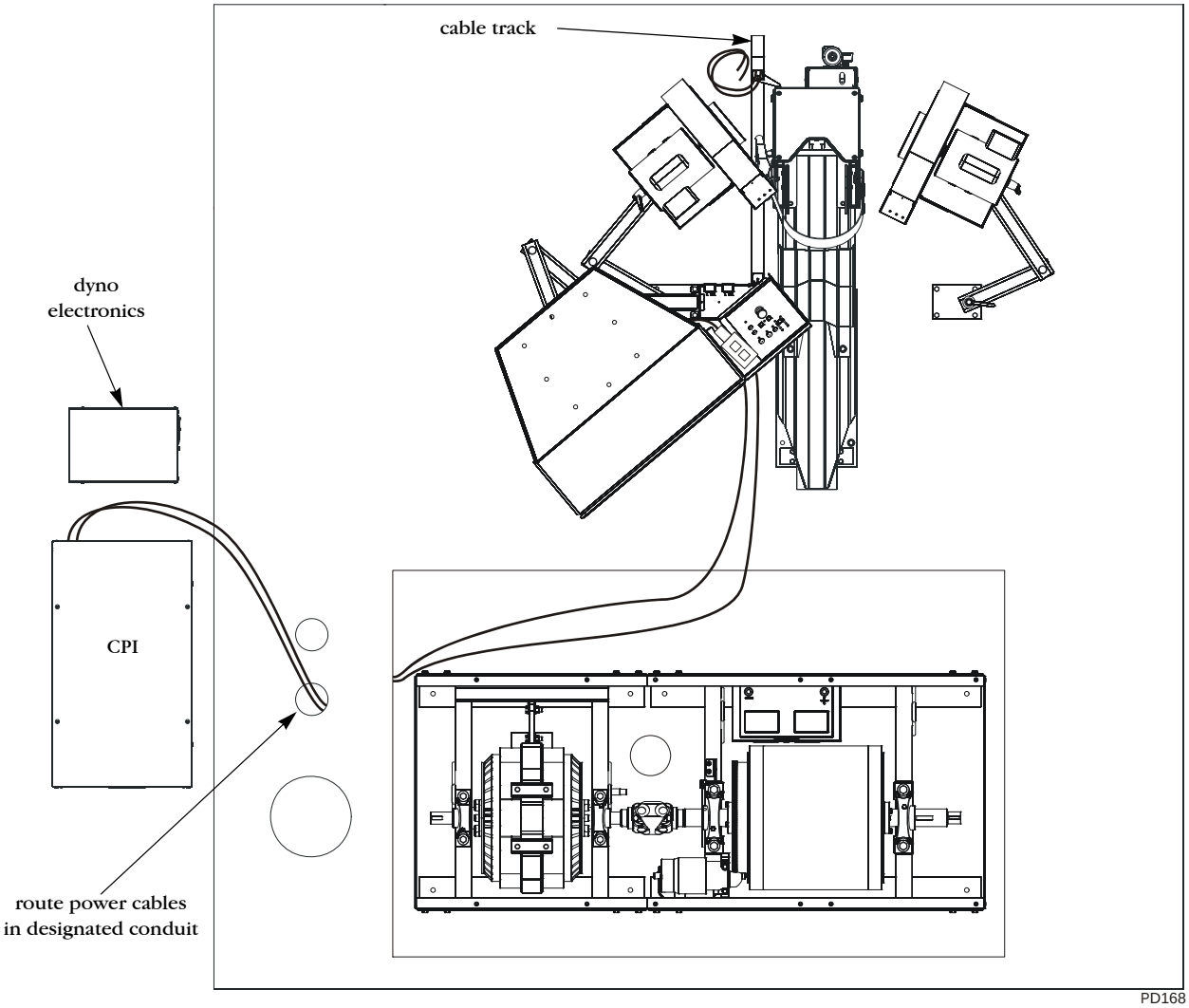


Figure 2-32: Route the Power Carriage and Wheel Clamp Cables

ROUTING THE EDDY CURRENT BRAKE, BATTERY, AND DYNO POWER CABLES

1 Route the eddy current brake cable (P/N 66952005) from the eddy current brake through the designated power pit conduit and to the theta controller.

2 Route the battery cable (P/N 76950312) from the CPI through the same conduit and over to the battery. Refer to the steps and Figure 2-34 on page 2-39 for instructions on connecting the battery and starter cables.

Note: Be sure to keep the power and communications cables in different pit conduits.

3 Route the temperature sensor cable from the eddy current brake through the designated pit conduit and to the break-out board, see Figure 2-37.

4 Route the dyno power cable from the CPI to your power source, but do not plug it in at this time.

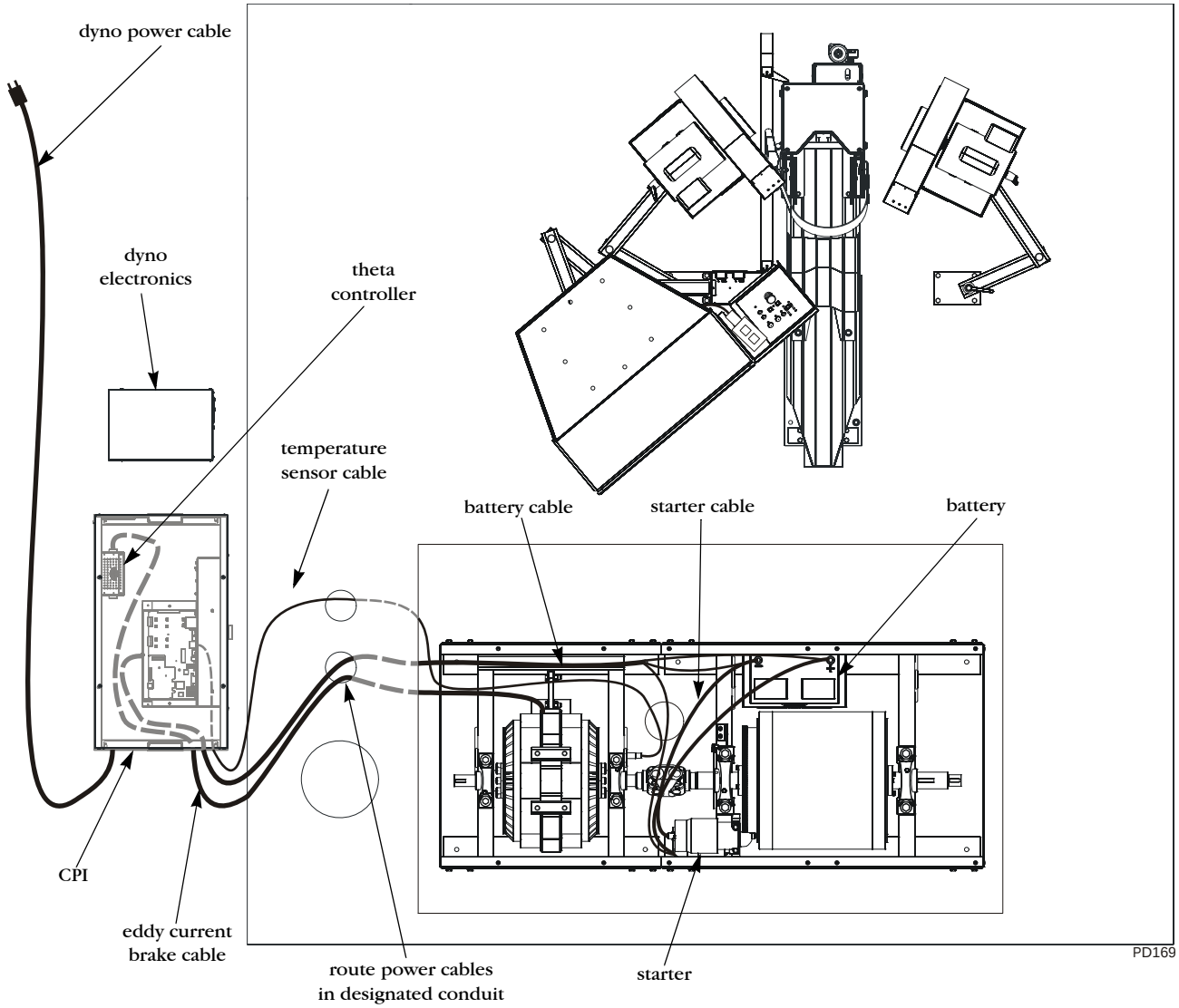


Figure 2-33: Route the Eddy Current Brake, Battery, and Power Cables

5 Connect the battery and starter cables.

Be sure to route the cables through the cable routing bracket. Secure the cables to the bracket using cable ties.

5a Attach the brown cable to the positive (+) battery post.

5b Attach the red battery cable to the positive (+) battery post and to the large stud on the starter solenoid.

5c Attach the blue and yellow cable to the negative (-) battery post.

5d Attach the black battery cable to the negative (-) battery post and to the grounding location on the starter brace.

5e Attach the blue cable to the starter solenoid.

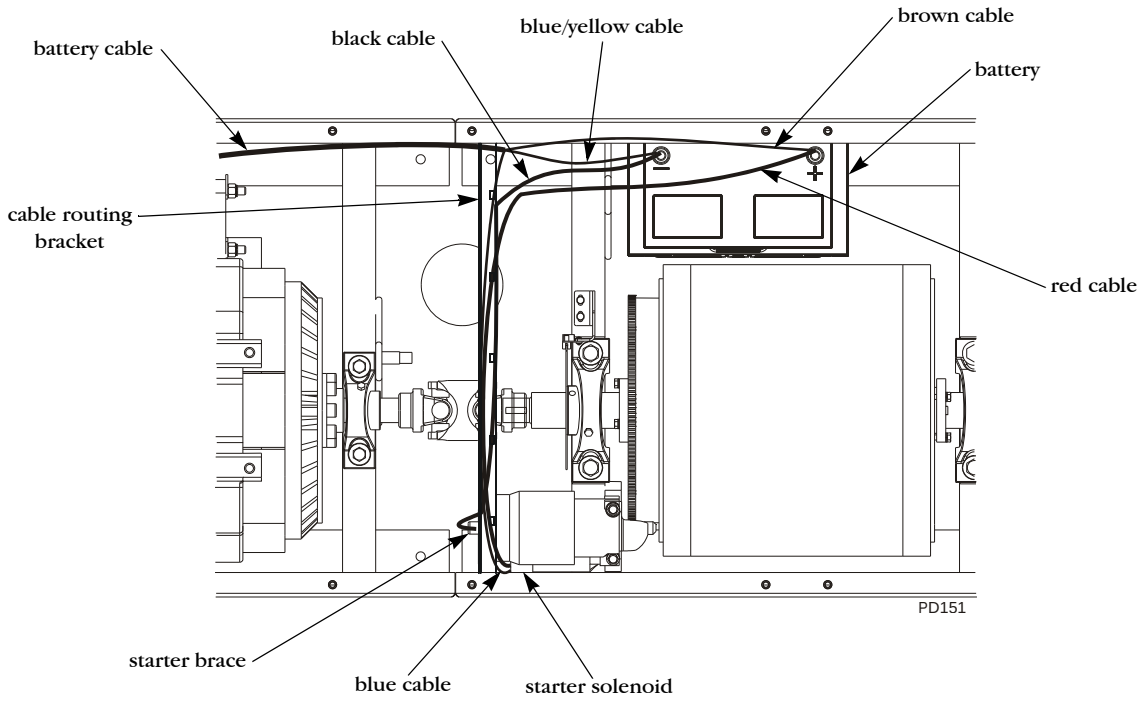


Figure 2-34: Connect the Battery and Starter Cables

ROUTING THE PICKUP CARD AND DYNO ELECTRONICS CABLES

1 Route the pickup card cable (P/N 66953002) from the CPI through the designated pit conduit and over to the pickup card. Attach the cable to the pickup card.

Note: Be sure to keep the power and communications cables in different pit conduits.

2 Route the 25-pin cable (P/N 42924251) from the dyno electronics input/output module to the Breakout board. Refer to Figure 2-37 for Breakout board location. Refer to "Dyno Electronics" on page 1-10 for the 25-pin cable location.

3 Route the 9-pin serial cable (P/N 42967090) from the dyno electronics CPU Module to your computer. Refer to "Dyno Electronics" on page 1-10 for the 9-pin serial cable location.

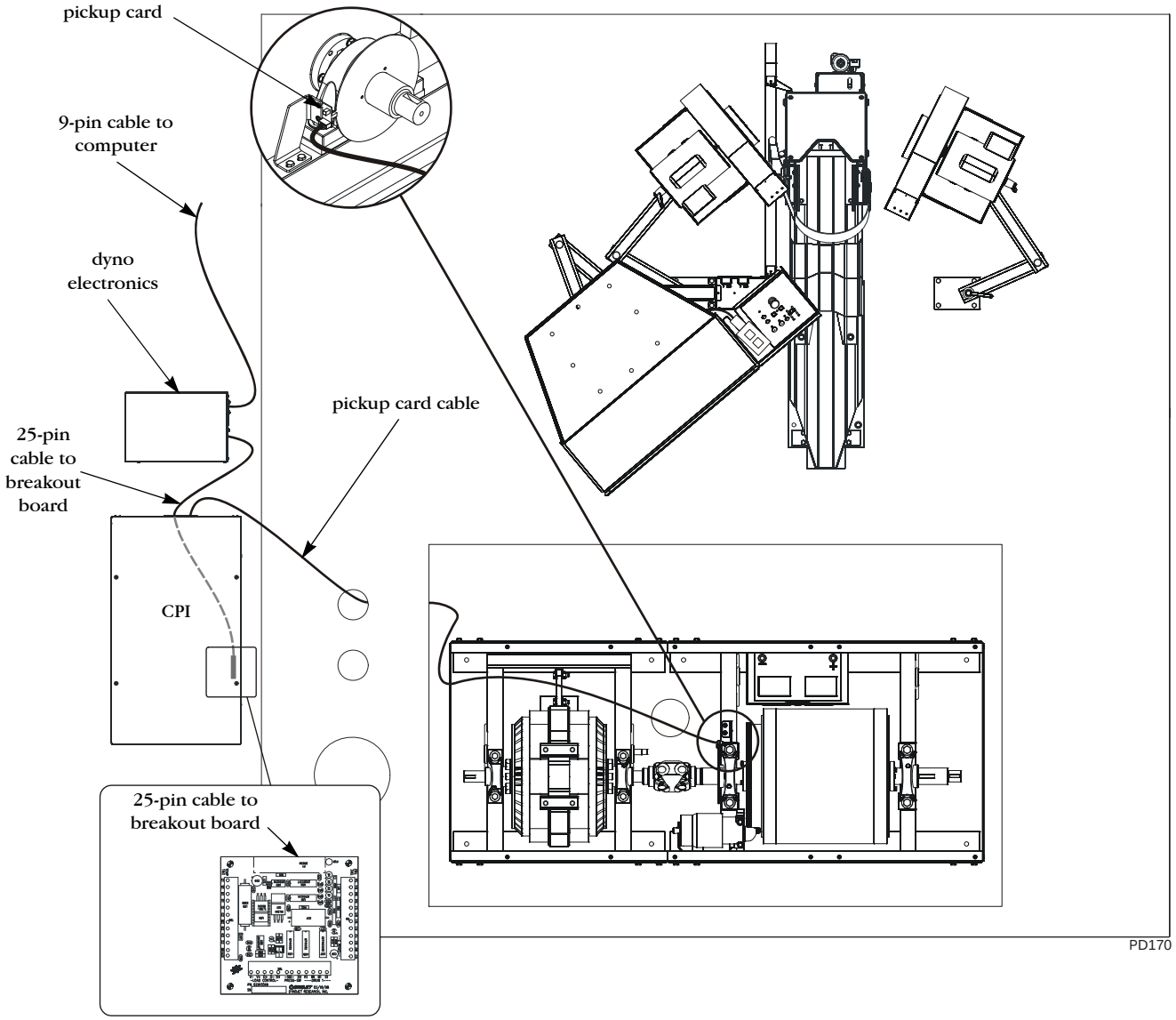


Figure 2-35: Route the Pickup Card and Dyno Electronics Cables

ROUTING THE AIR PUMP POWER, AIR FUEL SENSOR, AND DYNO ELECTRONICS POWER CABLES

1 Route the air pump power cable (P/N 76950318) from the CPI to the air pump.
2 Route the air fuel sensor cable (P/N 76950701) from the dyno electronics to the air pump.
3 Route the dyno electronics power cable to your power source. Refer to "Dyno Electronics" on page 1-10 for the dyno electronics power cable location.

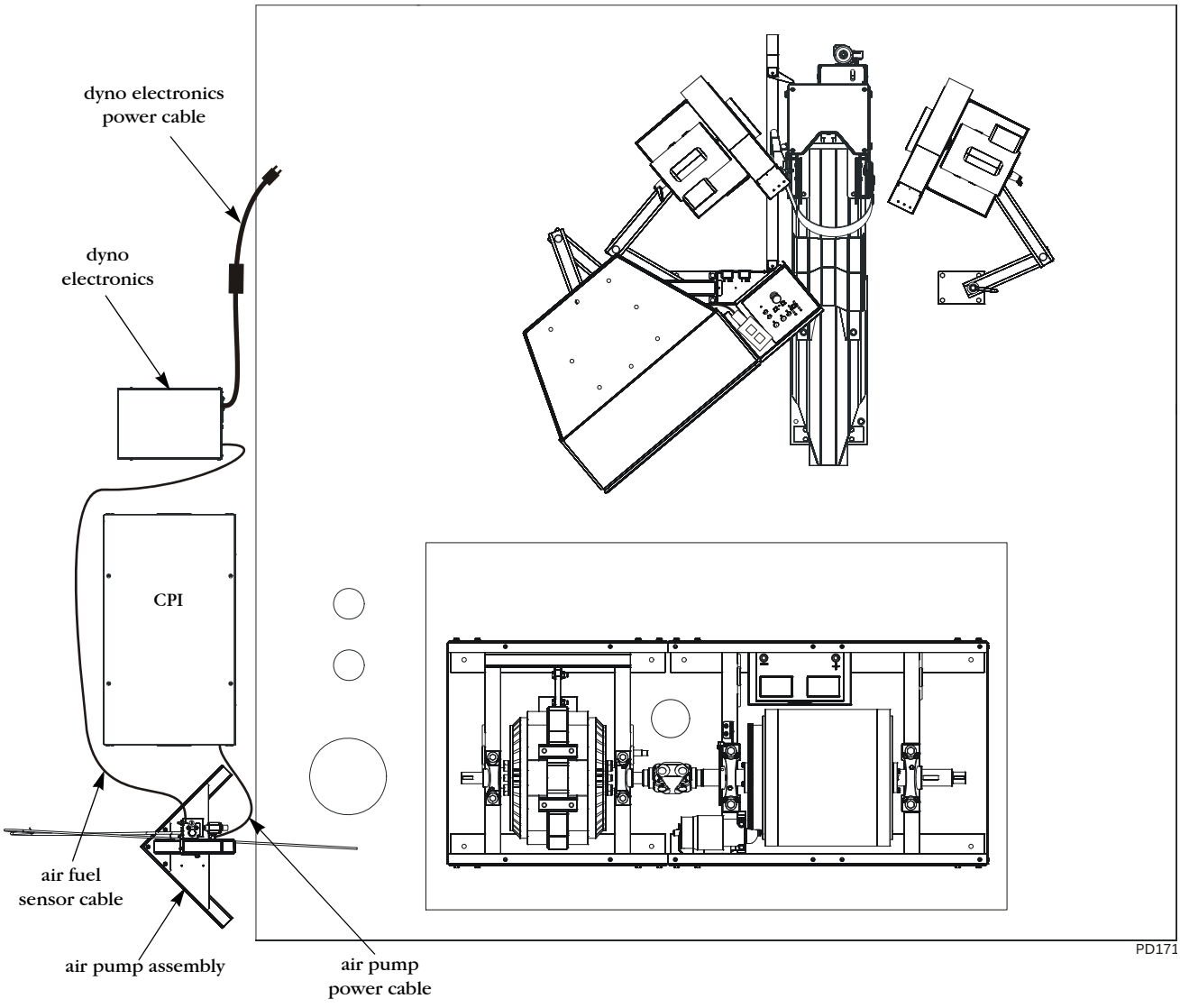


Figure 2-36: Route the Air Pump Power, Air Fuel Sensor, and Dyno Electronics Power Cables

WIRING THE BREAKOUT BOARD

1 Attach the temperature sensor cable to the Breakout board. The temperature sensor cable has five wires which connect to the wiring block labeled TEMP. This cable was routed to the Breakout board on page 2-38.

- Green wire connects to G1
- White wire connects to W1
- Black wire connects to B1
- Red wire connects to R1
- Ground (shield) wire connects to S1

2 Attach the theta controller cable to the Breakout board, if it is not already connected. The theta controller cable has five wires which connect to the wiring block labeled LOAD CONTROL.

- Black wire connects to V-
- Red wire connects to V+
- White wire connects to O+
- Green wire connects to O-
- Ground (shield) wire connects to SH

3 Attach the pickup card cable to the Breakout board. The pickup card cable has four wires which connect to the wiring block labeled DRUM 1.

- Red wire connects to R1
- Black wire connects to B1
- White wire connects to W1
- Ground (shield) wire connects to S1

4 Verify jumpers J1 and J2 are set either for the eddy current brake and air brake or for the air brake only as shown in Figure 2-37.

If you have an eddy current brake and air brake, the air brake will only be activated when the dyno electronics power is turned off, the E-stop button is pressed, or the optional door interlock is installed and activated.

5 Close the CPI front access panel. Refer to page 2-31.

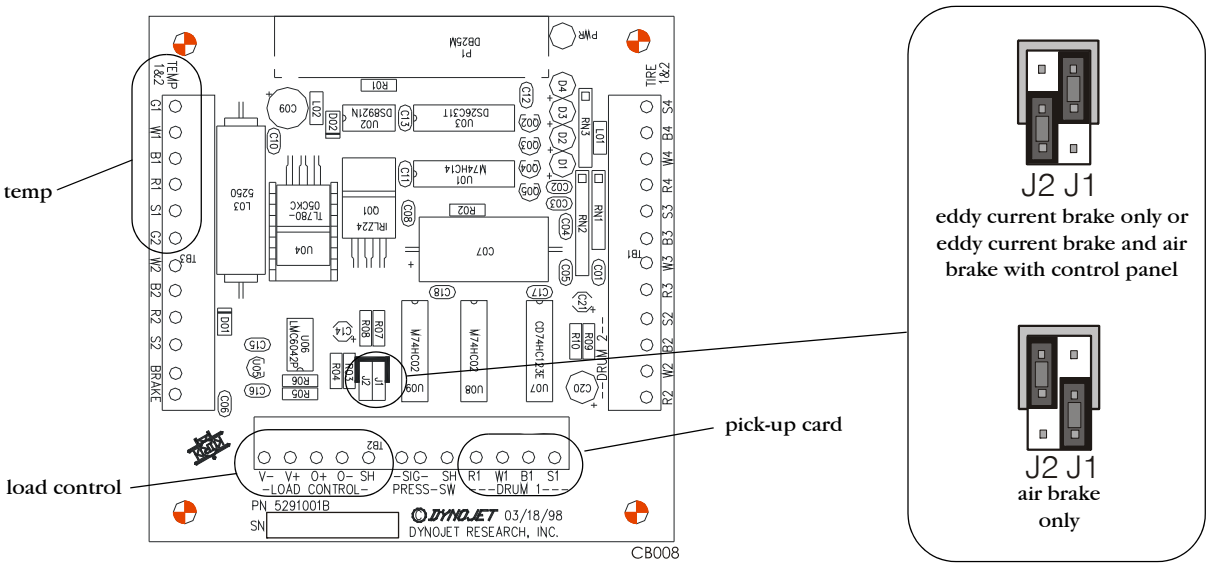


Figure 2-37: Wire the Breakout Board

POWER CARRIAGE INSTALLATION

You will need the following part:

- 82943001 Power Carriage

1 Remove the four screws securing the power carriage cover and set aside.

2 Bring the power carriage cable (two-pin connector) from the cable track over to the motor mount.

3 Secure the strain relief to the side of the power carriage motor mounts.

4 Place the power carriage motor assembly near the motor mount and plug the motor connector into the power carriage cable.

5 Secure the power carriage cover using the four screws removed earlier.

6 Verify the carriage moves without binding. Refer to “Final Adjustments and Tests” on page 2-46.

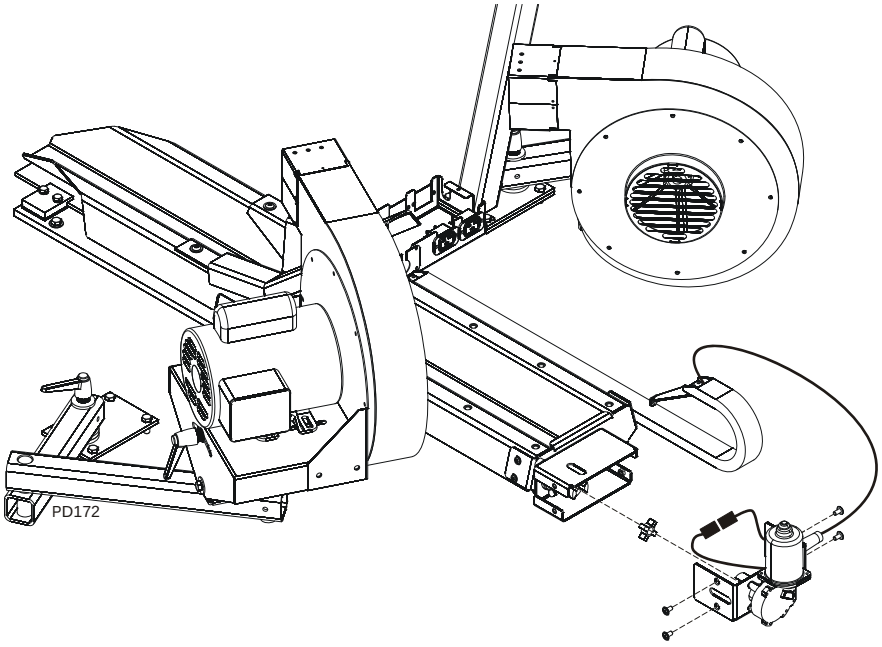


Figure 2-38: Install the Power Carriage

TIRE STOP INSTALLATION

If you ordered the optional wheel clamp, refer to "Wheel Clamp" on page 3-17 for instructions on securing the cable track and connecting the wheel clamp cable. If you did not order the wheel clamp, the wheel clamp cable will hang from the cable track.

You will need the following parts:

- 21626218 Cable Track Adapter Bracket
- 36561045 Screw, 1/4-20 x 5/8", Pan-Head, Torx
- 63310902 Tire Stop includes
  36580434 Bolt, 3/8-16 x 1/2", Button-Head Flange, Allen (4)

1 Secure the tire stop to the carriage using three 3/8-16 x 1/2-inch button-head flange bolts.

2 Secure the cable track adapter bracket to the tire stop and carriage using the remaining 3/8-16 x 1-2-inch button-head flange bolt.

3 Secure the cable track to the adapter bracket using one 1/4-20 x 5/8-inch pan-head torx screw.

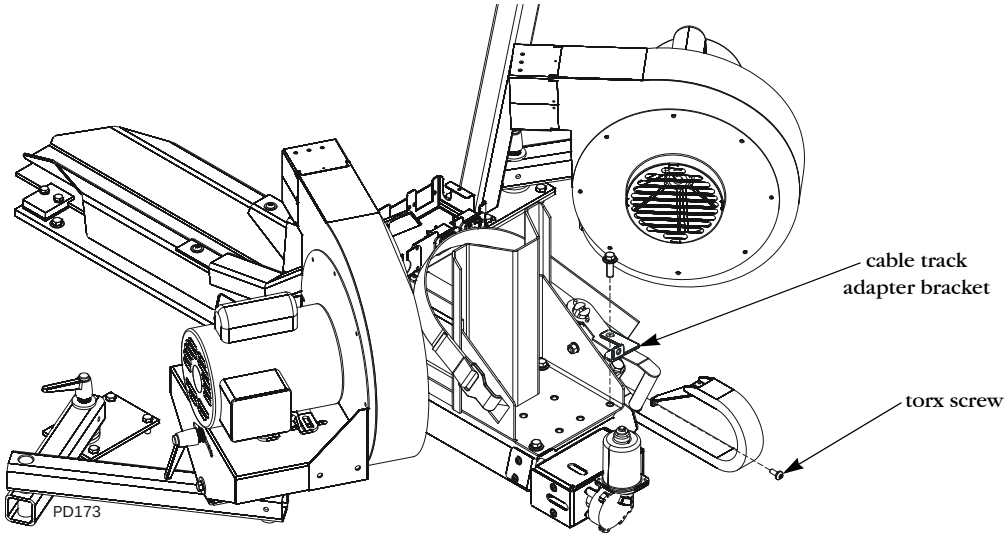


Figure 2-39: Install the Cable Track Adapter Bracket

FINAL ADJUSTMENTS AND TESTS

After you have installed all of your additional accessories and routed all necessary cables, perform the following procedures to ensure the safe and effective operation of your dyno.

> **Note:** Before you plug in your dyno, you or your electrician must refer to Appendix B for detailed power information.

Always turn the power off when connecting and disconnecting cables.

TURNING ON THE DYNO POWER

1. Replace the CPI cover if it was removed. Refer to page 2-31 for more information.
2. Plug the power plug into the power outlet.
3. Turn on the main breaker inside the CPI door.

   Note: Use the main breaker to turn power on and off to the dyno.

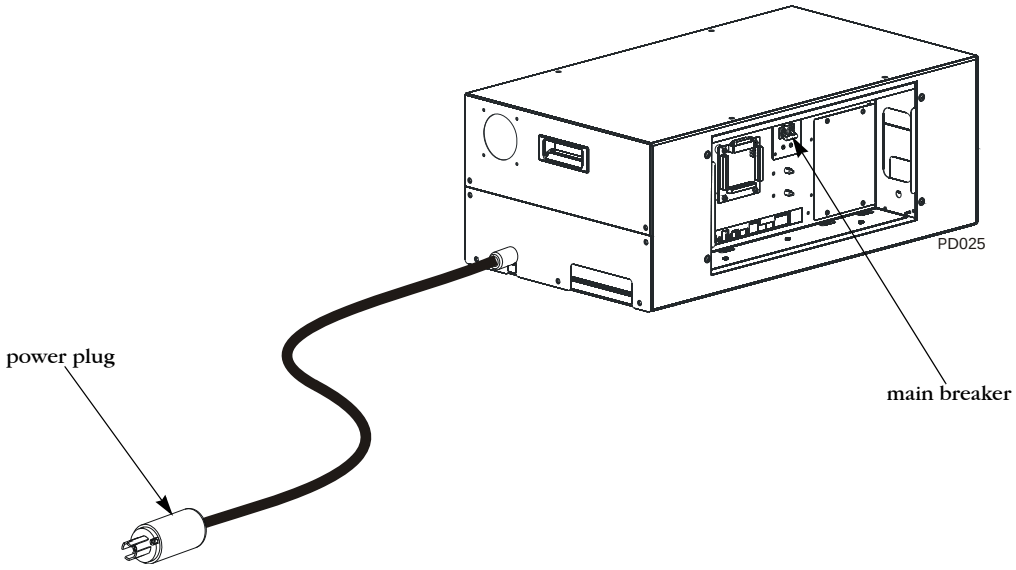


Figure 2-40: Turn on the Dyno Power

HIGH PRESSURE BLOWER TEST

Test the blowers by pressing the appropriate buttons on the control panel. If the right-hand blower turns on when the left-hand blower button is pressed, shut off the blowers and switch the cables at the junction box.

POWER CARRIAGE FINAL ADJUSTMENTS AND TESTS

The power carriage allows you to easily adjust for various wheel bases distances with the press of a button. Refer to "Using the Power Carriage" on page 4-5 for more information on using the power carriage. To route the power carriage cables refer to "Routing the Power Carriage and Wheel Clamp Cables" on page 2-37.

Using the Control Panel, press the carriage forward and backward buttons and verify that the motor does turn.

WHEEL CLAMP FINAL ADJUSTMENTS AND TESTS

The wheel clamp is an optional accessory. To install the wheel clamp refer to "Wheel Clamp" on page 3-17. To route the wheel clamp cables refer to "Routing the Power Carriage and Wheel Clamp Cables" on page 2-37.

1 Place a stack of catalogs into the wheel clamp.

2 Using the Control Panel, press the close button and observe that the wheel clamp does close. Hold the button until the motor turns off and the status light is on steady.

3 Press and hold the right hand wheel clamp button then press the left hand button to open the clamp.

Refer to "Using the Wheel Clamp" on page 4-6 for more information on using the Control Panel.

PIT COVERS

Before installing the covers, be sure to install the battery, pickup card, eddy current brake, air brake, EEC Kit, and any accessories you may have purchased with your dyno.

This section describes how to install the pit covers and drum guards.

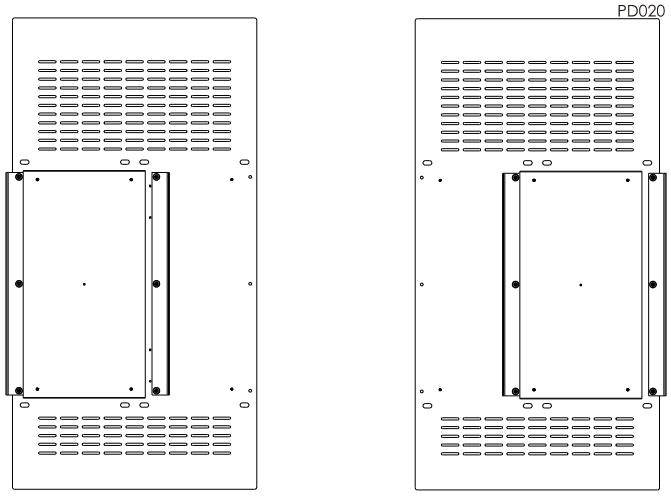
You will need the following parts:

- 21226104 Right Pit Cover
- 21226105 Left Pit Cover
- 21226106 Eddy Current Brake Pit Cover
- 21229111 Drum Guard, Side (2)
- 21624103 Drum Guard Mounting Bracket
- 36561045 Screw, 1/4-20 x 5/8", Pan-Head, Torx (12)
- 36580434 Bolt, 3/8-16 x 1/2", Button-Head, Flange, Allen (12)
- DM150-020-005 Nut, crush, 1/4-20 (4)

CHANGING THE EDDY CURRENT BRAKE COVER FOR RIGHT SIDE INSTALLATIONS

This installation has been designed for the eddy current brake to be installed on the left side of the dyno. Contact Dynojet for information regarding installation on the right.

If you ordered an eddy current brake (retarder) and plan to mount it on the right side, you will need to change the eddy current brake cover.



left side installation
looking from the bottom

right side installation
looking from the bottom

Figure 2-41: Eddy Current Brake Cover for Left and Right Side Installations

1 Remove the six 1/4-20-inch button-head screws, 1/4-inch flat washers, and 1/4-20-inch lock nuts securing the two angle supports to the bottom of the eddy current brake cover and set aside.

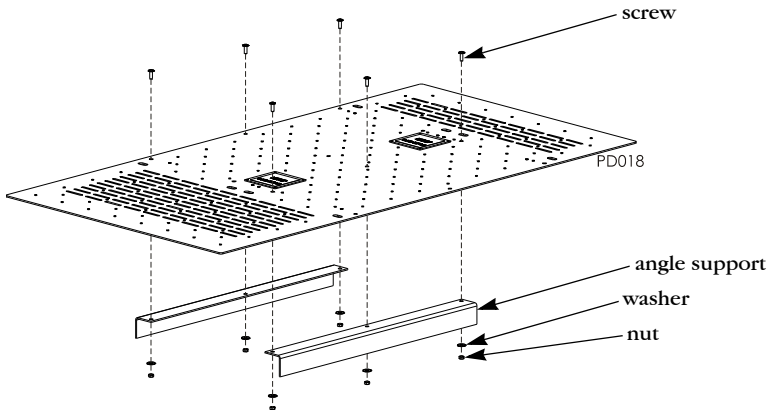


Figure 2-42: Right Side Eddy Current Brake Cover—Angle Supports

2 Remove the four No. 6-32 pan head screws securing the heat shield and insulation and set aside.

3 Move the heat shield and insulation to other side of the cover as shown in Figure 2-41 and secure with the four No. 6-32 pan head screws removed earlier.

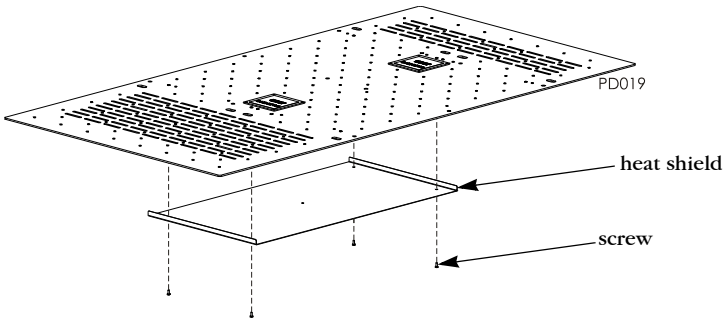


Figure 2-43: Right Side Eddy Current Brake Cover—Heat Shield and Insulation

4 Move the two angle supports to the other side of the cover as shown in Figure 2-41 and secure with the six 1/4-20-inch button-head screws, 1/4-inch flat washers, and 1/4-20-inch lock nuts removed earlier.

5 Continue with the instructions for installing the pit covers.

INSTALLING THE PIT COVERS

1 Place the eddy current brake cover over the brake module.

2 Loosely secure the eddy current brake cover using four 3/8-16 x 1/2-inch button-head flange screws. Do not tighten.

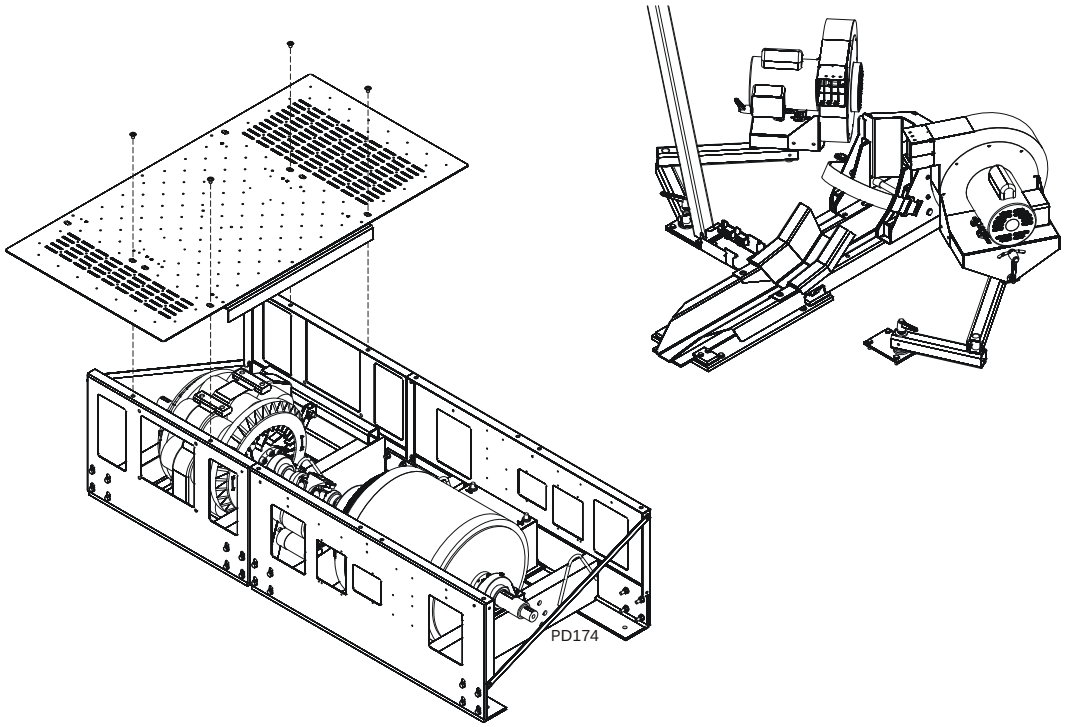


Figure 2-44: Install the Eddy Current Brake Cover

Note: If this is a European dyno, you will need to install the EEC finger guards. Refer to Appendix C for EEC finger guard installation instructions.

3 Loosely attach the drum guard bracket to the left side drum cover using four 1/4-20 x 5/8-inch pan-head torx screws.

Note: Dynojet recommends using a T30 Torx driver (Snap-On PFTx30E) to secure the 1/4-inch screws. For dynos with serial numbers lower than 2030152, Dynojet recommends using a hardened 5/32-inch hex driver (such as Snap-On Fa5E) to attach the 1/4-inch screws. A standard allen key may round off in the shallow screw head.

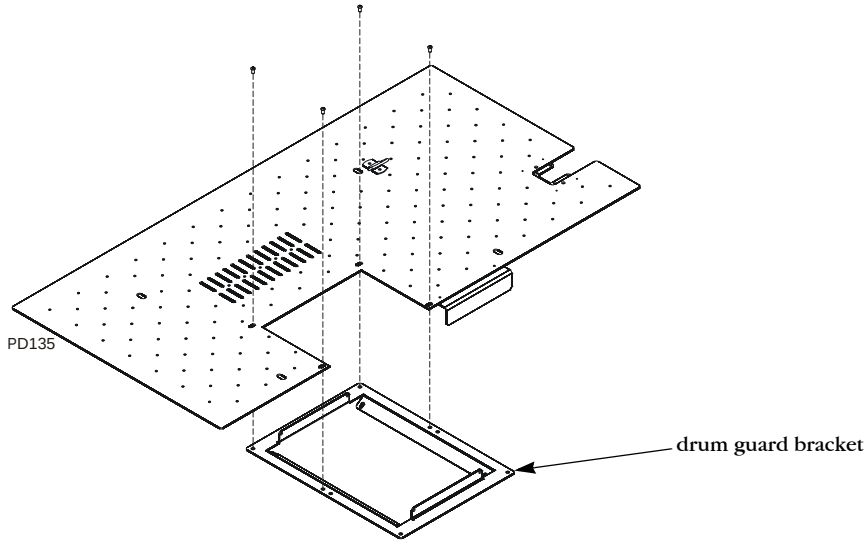


Figure 2-45: Install the Drum Guard Bracket

4 Place the left side drum cover over the drum module.

5 Verify all the cables are routed under the left drum cover and through the cable routing opening.

6 Loosely secure the left side drum cover using four 3/8-16 x 1/2-inch button-head flange screws. Do not tighten.

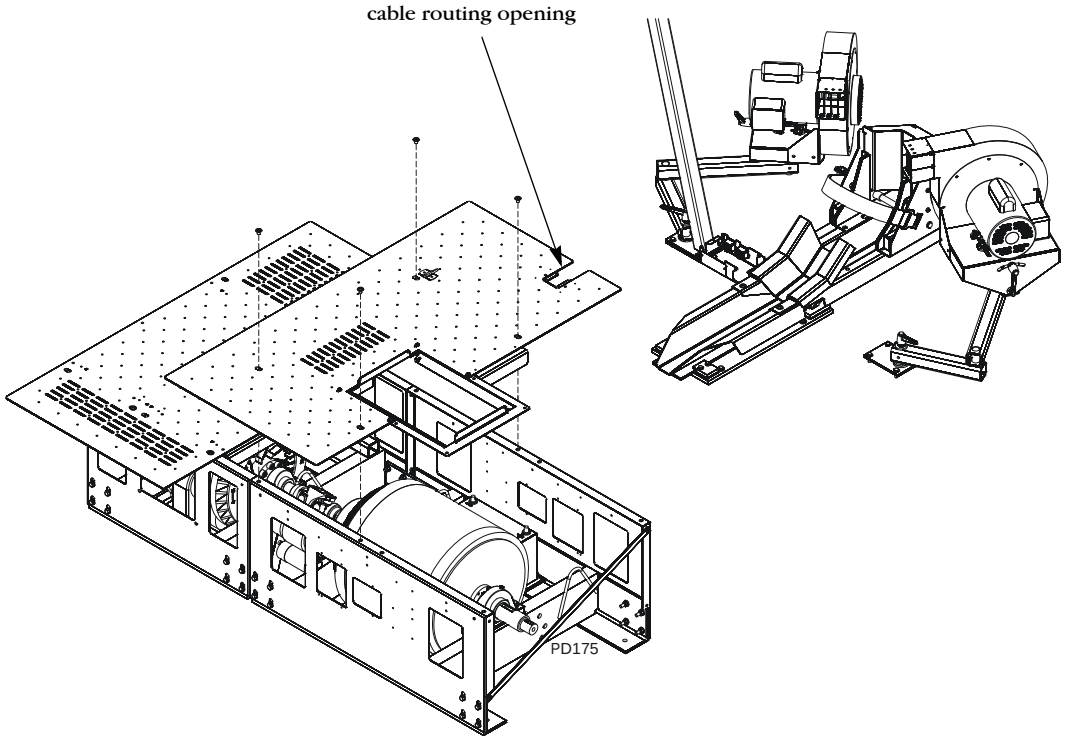


Figure 2-46: Install the Left Side Drum Cover

7 Place the right side drum cover over the drum module.

8 Loosely secure the right side drum cover to the drum guard bracket using four 1/4-20 x 5/8-inch pan-head torx screws.

9 Loosely secure the right side drum cover using four 3/8-16 x 1/2-inch button-head flange screws. Do not tighten.

10 Center the drum guard mounting bracket over the drum. Verify the drum does not contact the mounting bracket.

11 Tighten all screws.

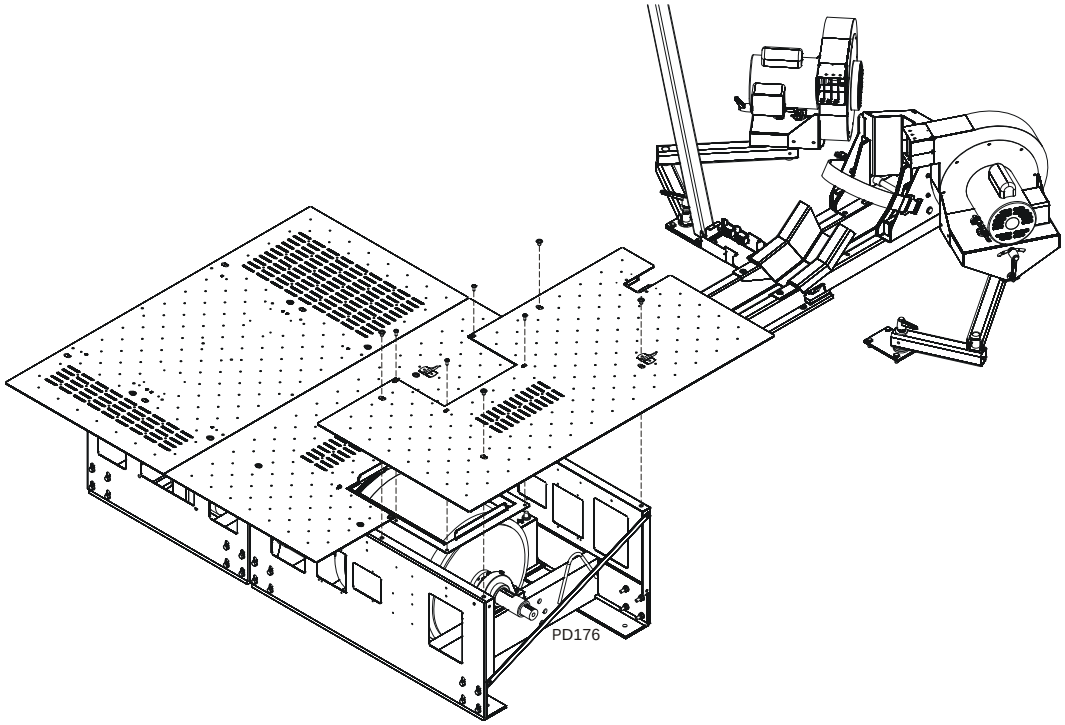


Figure 2-47: Install the Right Side Drum Cover

12 Install each drum guard to the drum guard mounting bracket using two 1/4-20 x 5/8-inch pan-head torx screws and two 1/4-20-inch crush nuts.

Note: Verify the drum guards do not contact the drum.

Note: If you installed the EEC finger guards, you will need to adjust them now. Refer to"Adjusting the EEC Finger Guards" on page C-3 for detailed instructions.

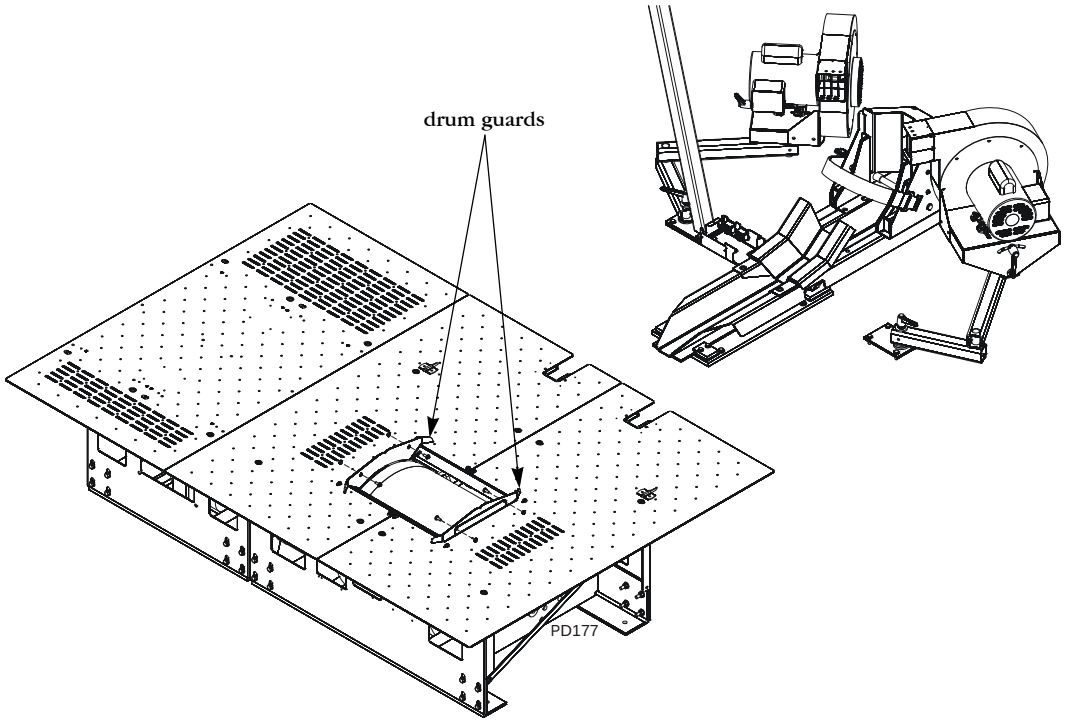


Figure 2-48: Install the Drum Guards

JUNCTION BOX COVER, CABLE COVER, AND END CAP

Before installing the junction box cover, cable cover, and end cap be sure to route all of your cables.

You will need the following parts:

- 21228517 Cable Routing Cover
- 21228519 Cable Channel End Cap
- 21228521 Junction Box Cover
- 21626902 Cable Cover, Pit to Junction Box
- 36540643 Screw, 8-32 x 3/8", Pan-Head, Phil (13)

1 Secure the junction box cover to the junction box using two 8-32 x 3/8-inch pan-head screws.

2 Secure the end cap to the pit cover using two 8-32 x 3/8-inch pan-head screws.

3 Secure the cable cover to the end cap using four 8-32 x 3/8-inch pan-head screws.

4 Secure the cable cover to the junction box cover using one 8-32 x 3/8-inch pan-head screw.

Note: Verify the cables are placed inside the cable cover.

5 Secure the cable routing cover to the right side pit cover using four 8-32 x 3/8-inch pan-head screws.

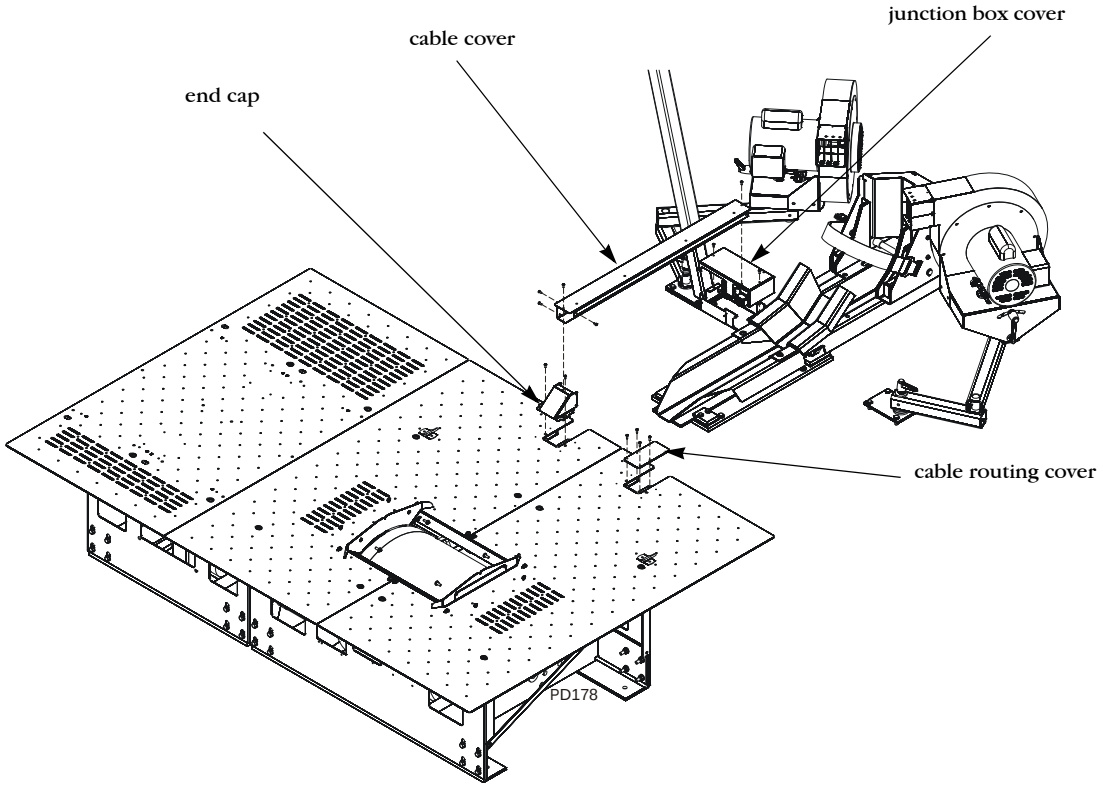


Figure 2-49: Install the Junction Box Cover, End Cap, and Cable Cover

ZIP TUBE

The zip tube encases the multiple cables running to the control panel. You will need to use the cable wrap tool (P/N 16510001) to insert the cables into the zip tube.

You will need the following part:

- 43400000 Cable Harness Wrap Kit

1 Rotate the cable holder to the open position.

2 Insert the cable(s) into the cable holder.

- Pendant Cable
- Control Panel Cable
- RPM cable(s)
- Additional cables, if desired

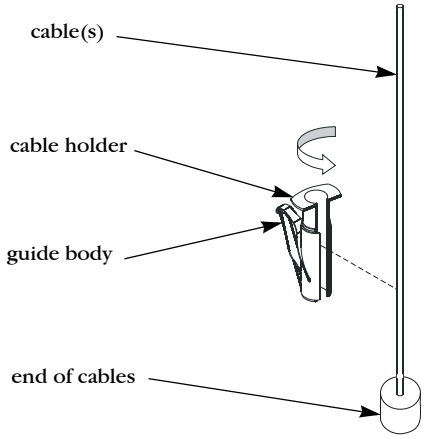


Figure 2-50: Insert Cable(s) Into Cable Holder

3 Rotate the cable holder closed.

4 Insert the guide body into the zip tube.

Note: Make sure you start the cable wrap tool close to the end of the cables. This will make it easier to pull the tool along the length of the cables.

5 Pull the cable wrap tool through the zip tube along the length of the cables.

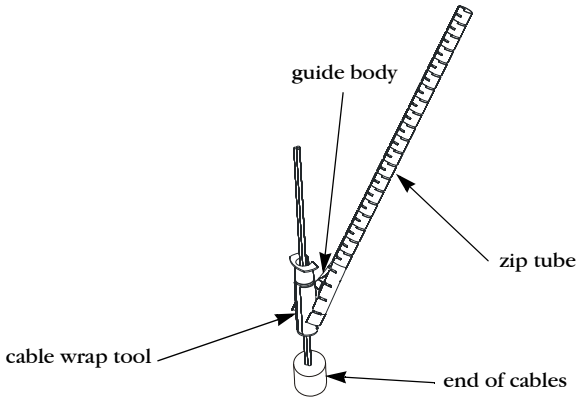


Figure 2-51: Securing Cable(s) Into the Zip Tube

CHAPTER

3

ACCESSORIES

This chapter discusses the various optional accessories that are available for the Dynojet Motorcycle Dynamometer (dyno) to meet your individual needs. All of these options can be added at the factory at the time of original dyno purchase, or purchased separately and added at any time thereafter. For more information about these accessories, please contact Dynojet's Product Specialists at 1-800-992-3525 for pricing and availability.

Installation instructions for some of these options can be found in this chapter. Complete installation instruction manuals may also be found by browsing the Manuals folder on your WinPEP installation CD.

This chapter is divided into the following categories:

- Main Dyno Power, page 3-2
- Air Brake, page 3-3
- Compressed Air Pump Assembly, page 3-16
- Wheel Clamp, page 3-17

MAIN DYNO POWER

Many instructions in this guide will require you to connect or disconnect the power to the dyno as part of the installation process. Use the following steps to connect and disconnect power to the dyno.

Note: Before you plug in your dyno, you or your electrician must refer to Appendix B for detailed power instructions.

Always turn the power off when connecting and disconnecting cables.

1 Use the main breaker to turn power on and off to the dyno.

The main breaker is located inside the CPI door. When the handle is in the down position all power into the dyno is turned off.

2 Disconnect the power plug to ensure all power has been removed from the dyno before performing certain installation procedures.

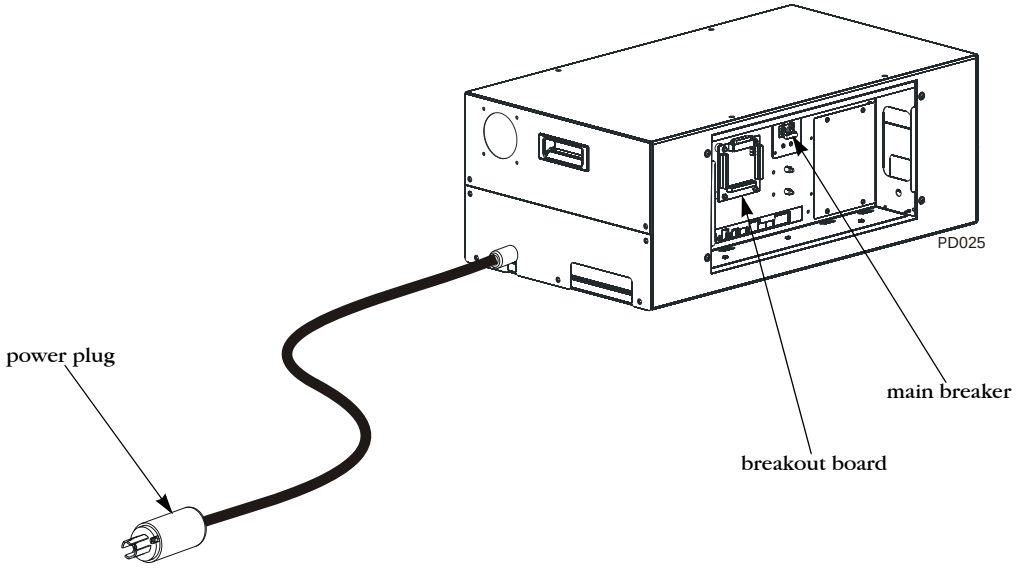


Figure 3-1: Main Dyno Power

AIR BRAKE

The optional air brake (P/N 63920005) comes installed and ready to use. You will need to provide an air hose nipple (1/4-inch NPT) to connect your clean, dry shop air supply (60 psi, 415 kilopascal, max constant line pressure) to the dynamometer. Once air pressure is connected and the air brake cable is routed, the air brake is ready to use.

Note: For information on installing the air brake, refer to the Air Brake and EEC Kit Installation Guide for Model 200i/250i and 200iP/250iP Motorcycle Dynamometer, P/N 98123114.

ROUTING THE AIR BRAKE CABLE AND AIR HOSE

1 Open the CPI front panel to access the breakers and Breakout board.

2 Route the air brake cable from the air brake solenoid to the CPI.

Note: The CPI end of the air brake cable splits in two.

3 Connect the cable with the two black wires to the Breakout board wiring block labeled Brake.

4 Attach the 4-pin connector to port P7 on the CPI board.

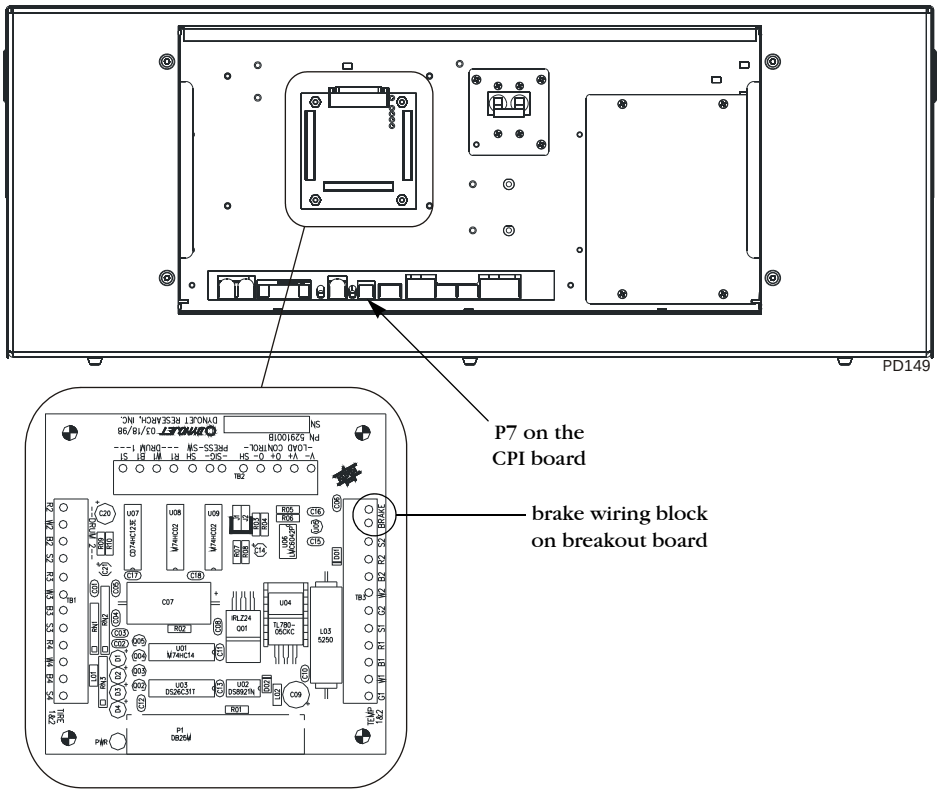


Figure 3-2: Routing the Air Brake Cable

5 Route the air brake air hose through the access hole in the drum module upright and through the pit conduit.

6 Connect your clean, dry shop air supply (60 psi, 415 kilopascal, max constant line pressure) to the air hose.

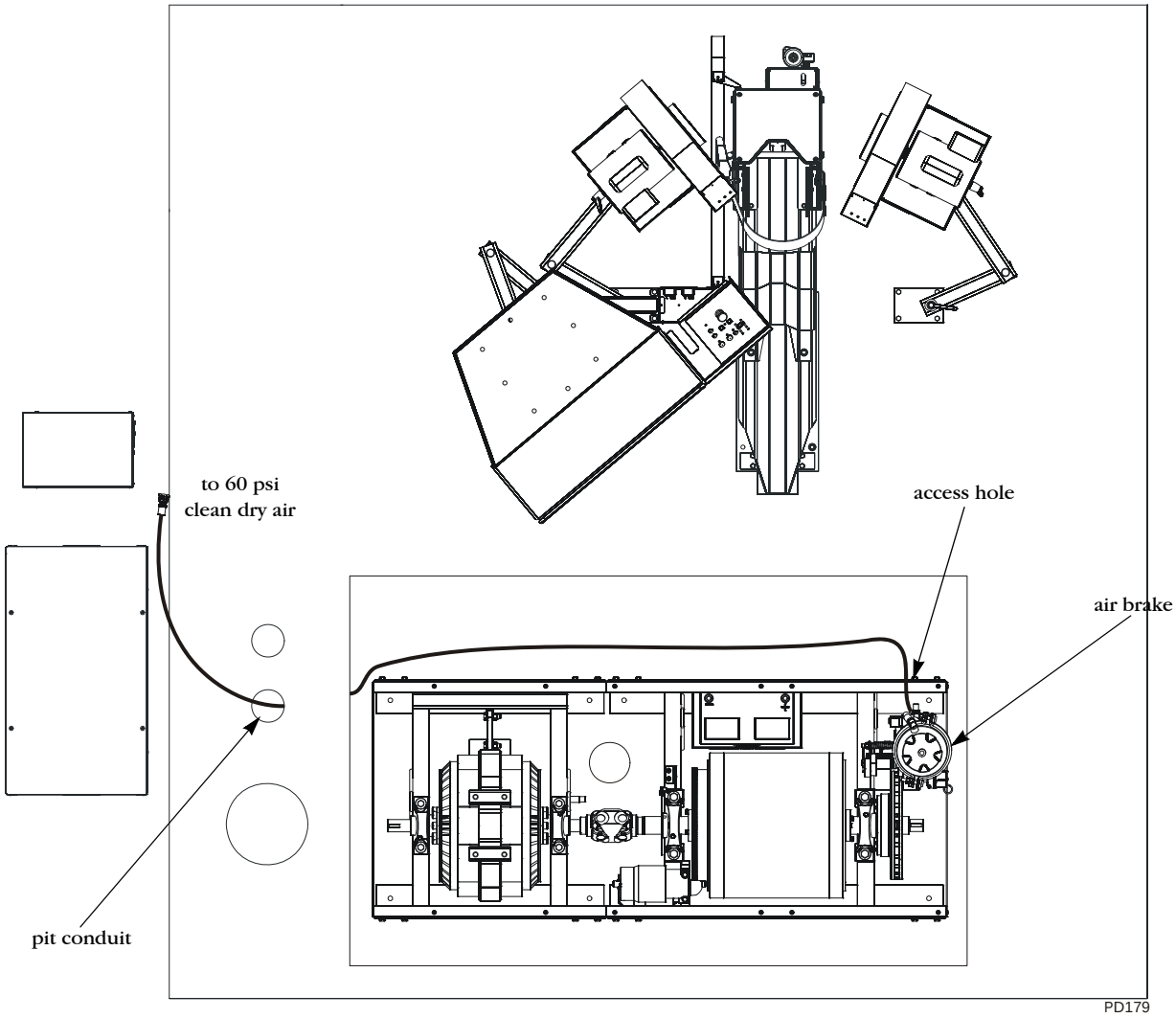


Figure 3-3: Connecting the Air Hose

INSTALLING THE EMERGENCY STOP STICKER

A properly installed air brake option adds an emergency stop function to the dyno shutdown button. With the air brake installed, activating the dyno shutdown button applies the brake and stops the drum. Installing the emergency stop sticker indicates the added functionality applied to the dyno shutdown button.

1 Remove the control panel rear cover.
   1a Remove the two nuts from the top of the cover and set aside.
   1b Remove the screw on the top of the cover and set aside.
   1c Remove the screw on the side of the cover and set aside.
   1d Remove the four screws on the back of the cover and set aside.
   1e Remove the control panel rear cover and set aside.

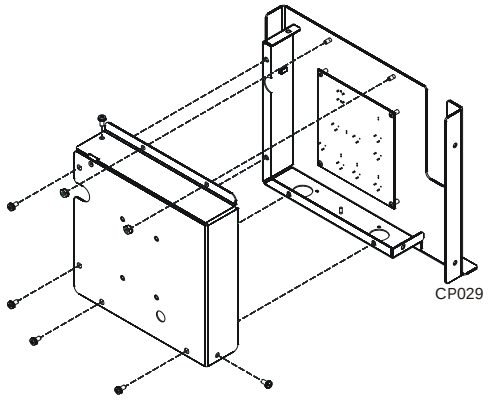


Figure 3-4: Remove the Control Panel Rear Cover

2 Remove the Button board.

2a Remove the four screws securing the Button board to the control panel and set aside.

2b Remove the Button board and set aside.

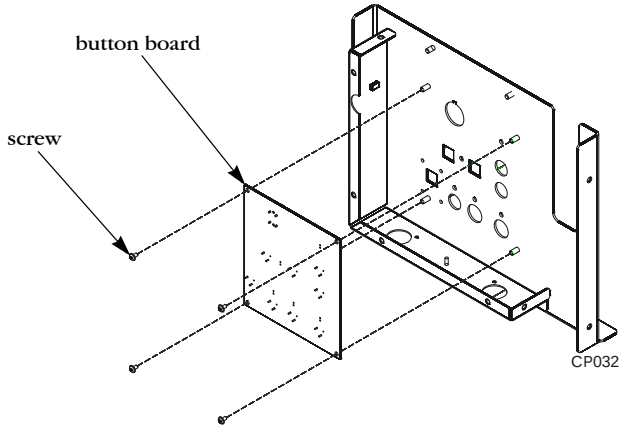


Figure 3-5: Removing the Button Board

3 Unscrew the black switch body nut and remove the switch body. Set the nut and switch body aside.

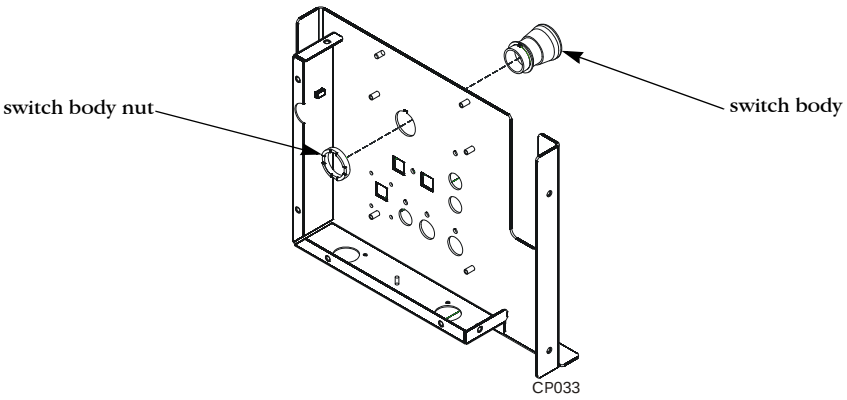


Figure 3-6: Removing the Switch Body

4 Place the emergency stop sticker over the dyno shutdown sticker.

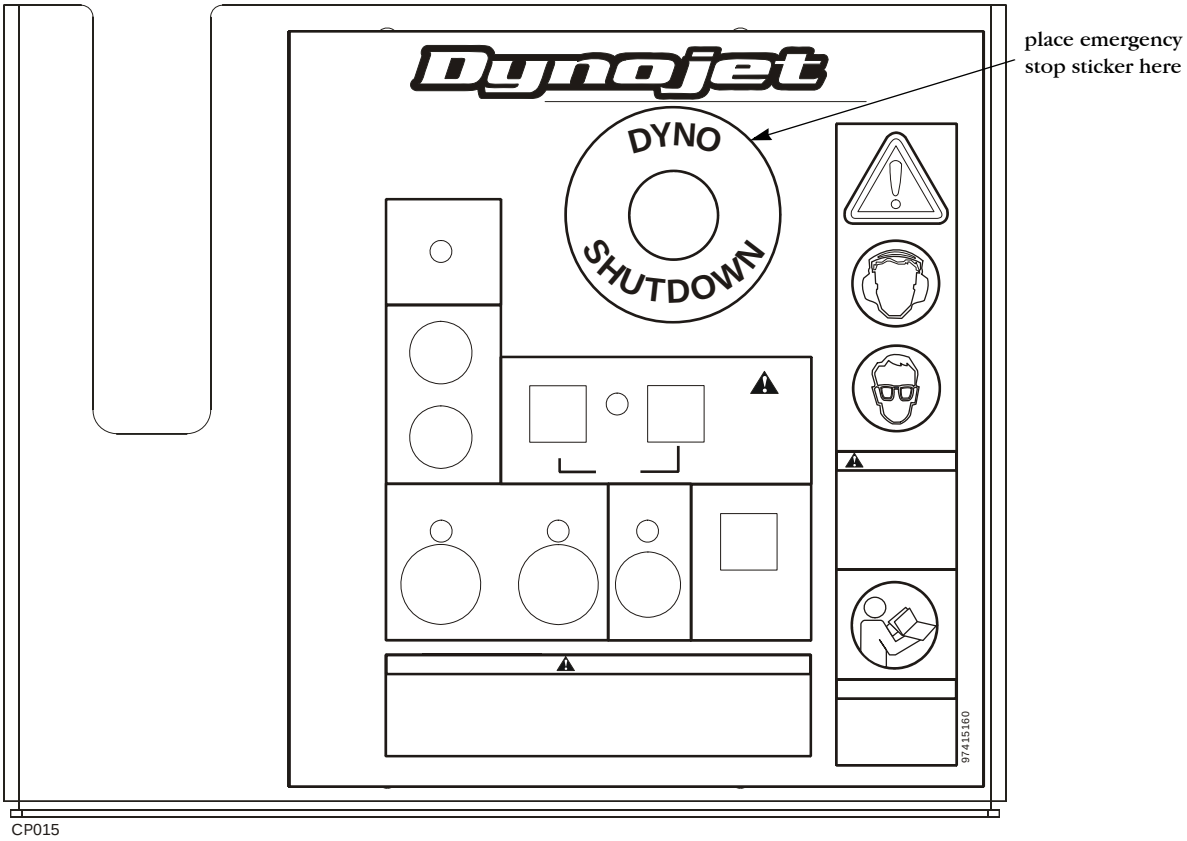


Figure 3-7: Placing the Emergency Stop Sticker

5 Secure the switch body to the control panel using the switch body nut removed earlier.

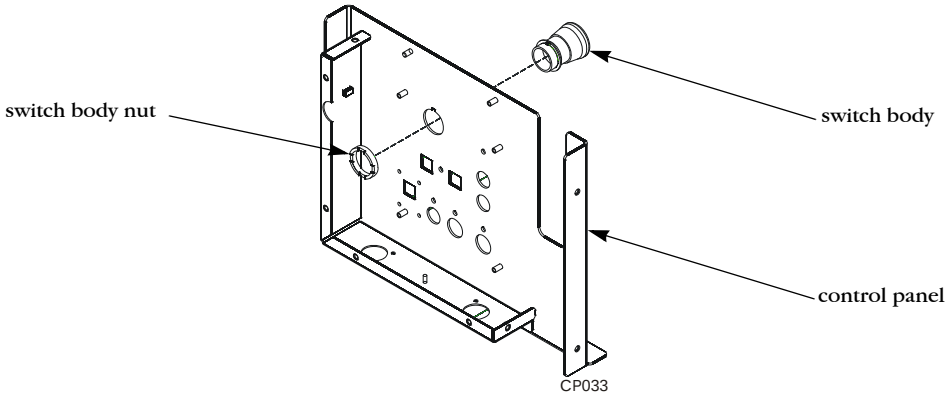


Figure 3-8: Replacing the Emergency Stop Button

6 Secure the Button board to the control panel using the four screws removed earlier.

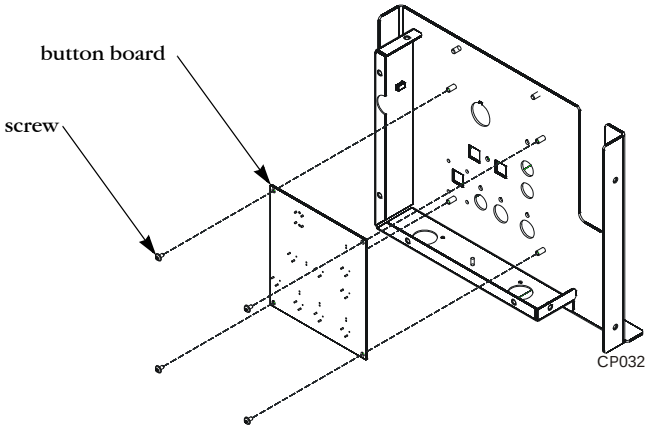


Figure 3-9: Securing the Button Board

7 Secure the rear cover to the control panel.
   7a Replace the four screws on the back of the cover removed earlier.
   7b Replace the screw on the top of the cover removed earlier.
   7c Replace the screw on the side of the cover removed earlier.
   7d Replace the two nuts removed from the top of the cover removed earlier.

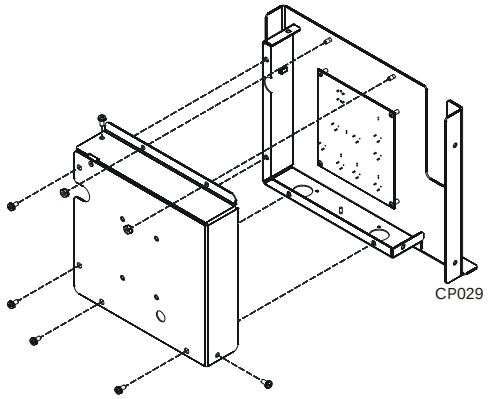


Figure 3-10: Replace the Control Panel Rear Cover

AIR BRAKE FINAL ADJUSTMENTS AND TESTS

1 Verify the dyno is set up properly, the dyno electronics is powered up and operational, and the air supply is connected properly.
2 Use the red brake button on the pendant or the emergency stop button on the control panel to activate and deactivate the brake. Listen for air leaks and double check all connections.
3 Verify the brake pads release far enough so they do not touch the rotor. There should be equal pad clearance on both sides of the rotor. If the pads touch the rotor during a run, the information provided by the dyno will be inaccurate.

   Refer to page 3-15 for instructions on adjusting the brake pad clearance.

CHANGING THE BRAKE PADS

WARNING

To prevent possible injury, disconnect the battery and unplug the dyno.

1 Open the CPI's front panel access and turn off the main breaker.
2 Unplug the dyno power cable. Refer to page 3-2.
3 Remove the eight button-head screws securing the right drum cover and set aside.
4 Remove the right drum cover and set aside.
5 For safety, apply the brake and disconnect the air supply.
6 Remove the hairpin cotter and loosen the castle nut until the pads clear the rotor.

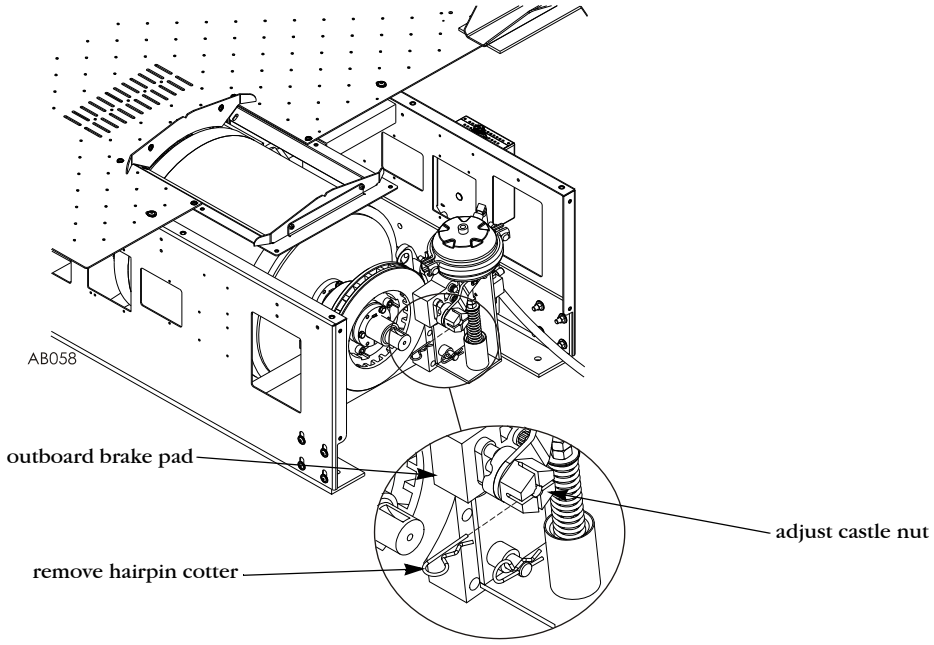


Figure 3-11: Loosen the Castle Nut

7 Using a 9/16-inch ratchet and wrench, remove the bolt, washer, and nut securing the spring to the brake assembly. The spring is located on the drum side of the brake assembly.

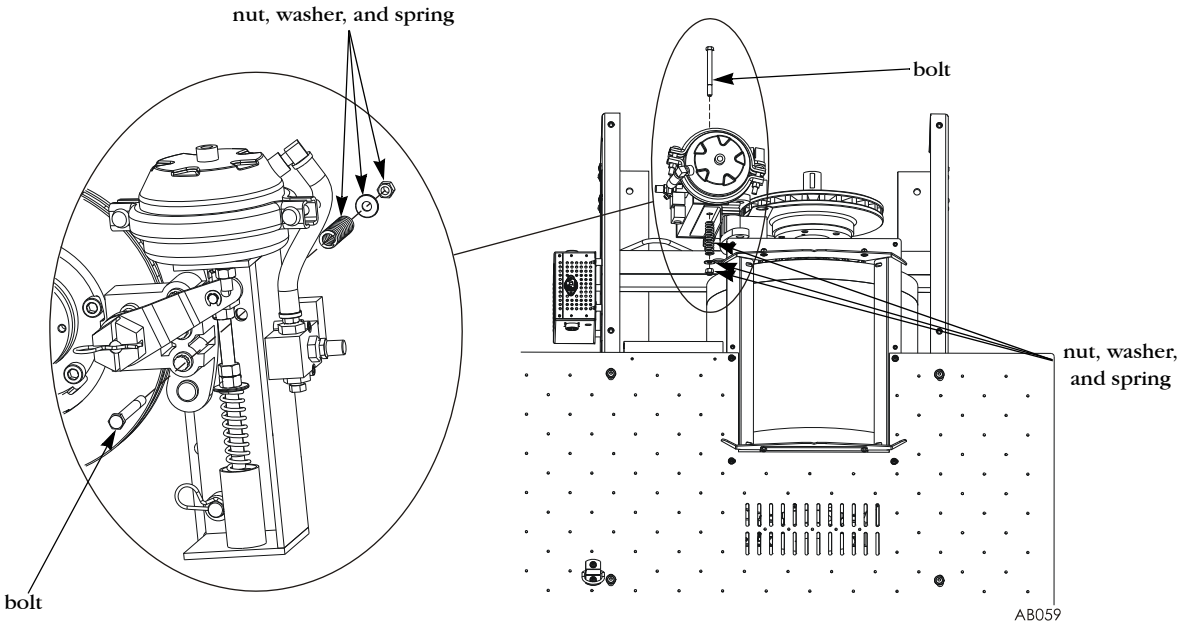


Figure 3-12: Remove the Brake Spring

8 Remove the two bolts and two washers securing the brake caliper stop to the brake bracket and remove the brake caliper stop.

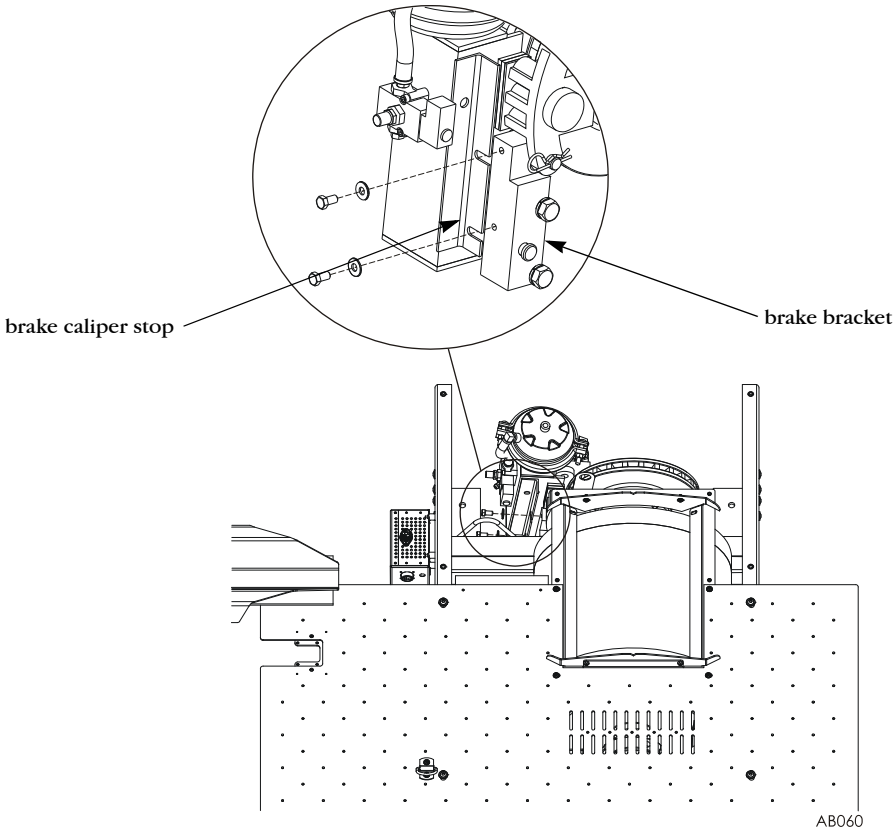


Figure 3-13: Remove the Brake Caliper Stop

9 Remove the hairpin cotter from the bottom clevis pin located on the front of the air brake assembly.

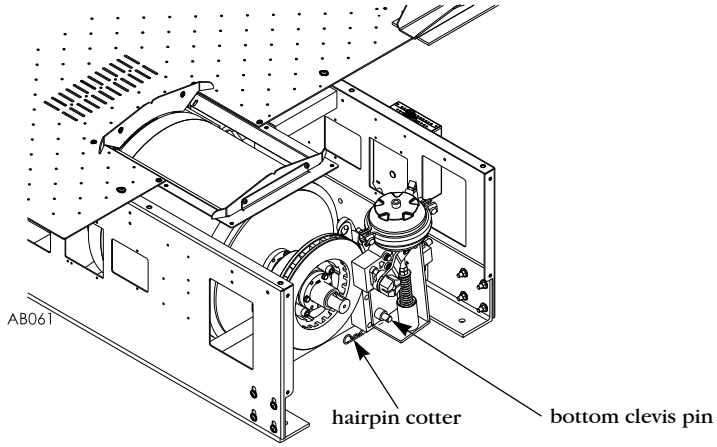


Figure 3-14: Remove Bottom Hairpin Cotter

10 Push the bottom clevis pin towards the back of the assembly (drum side). You do not need to remove the pin completely.

11 Remove the hairpin cotter from the top clevis pin located on the drum side of the air brake assembly.

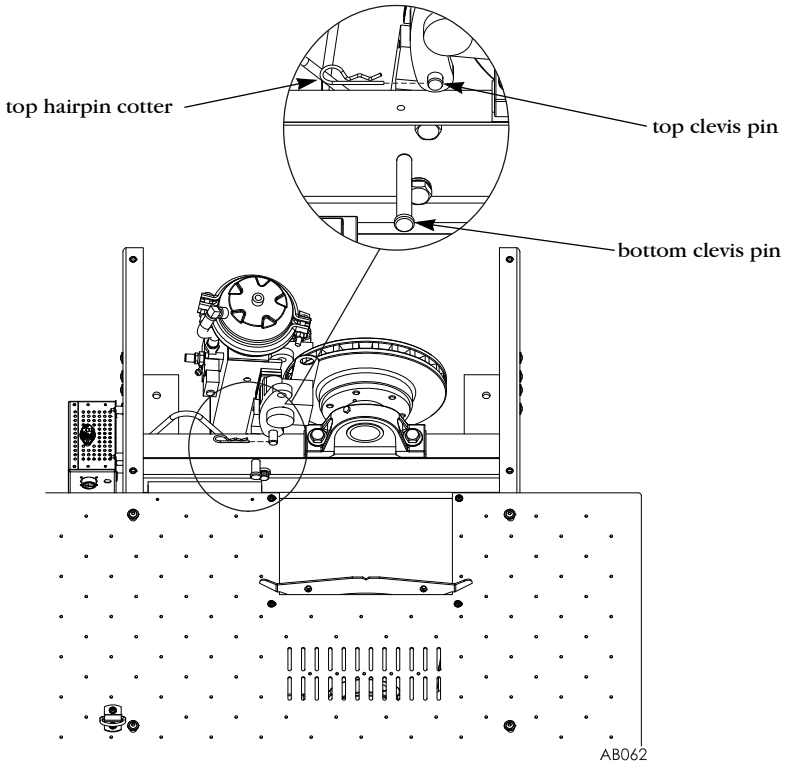


Figure 3-15: Remove Bottom Pin and Top Hairpin Cotter

12 Remove the top clevis pin.

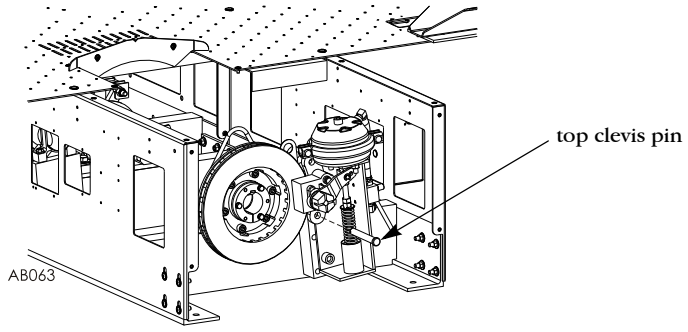


Figure 3-16: Remove the Top Clevis Pin

13 Lift the air brake assembly up and away from the dyno.

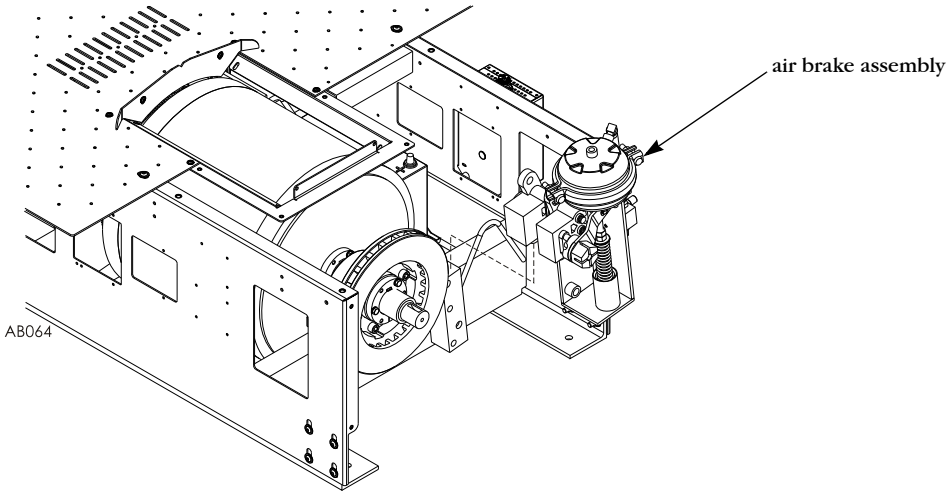


Figure 3-17: Remove the Brake Assembly

14 Remove the brake pad retaining springs and slide the pads out.

Note: You will need to use pliers to remove the spring securing the outside pad (closest to the castle nut).

15 Install the new brake pads and secure the pads with new springs.

16 Place the air brake assembly back on the brake bracket. Refer to Figure 3-17.

17 Replace the top and bottom clevis pins and secure with the hairpin cotters removed earlier. Refer to Figure 3-14, Figure 3-15, and Figure 3-16.

18 Using two bolts and two washers, secure the brake caliper stop to the brake bracket. Refer to Figure 3-13.

19 Secure the spring using the bolt, washer, and nut you removed earlier. Refer to Figure 3-12.

20 Tighten the castle nut and replace the hair pin cotter. Refer to Figure 3-11.

21 Adjust the brake pad clearance. Refer to page 3-15 for complete instructions.

22 Replace the right drum cover using the eight button-head screws remove earlier.

23 Connect your shop air.

24 Turn the dyno power on using the main breaker. Refer to page 3-2.

ADJUSTING THE BRAKE PAD CLEARANCE

There should be equal pad clearance on both sides of the rotor. If the pads touch the rotor during a run, the information provided by the dyno will be inaccurate. Use the following steps to adjust the clearance.

1 Loosen the brake caliper stop bolts.

2 Insert the brake adjusting shim between the inboard brake pad and the brake rotor. Refer to Figure 3-18.

3 Remove the hairpin cotter and hand tighten the castle nut on the caliper assembly to clamp the brake pads against the rotor and shim. Refer to Figure 3-11 for hairpin and castle nut location.

4 Tighten the brake caliper stop bolts.

5 Loosen the castle nut and remove the shim.

6 Adjust the clearance between the outboard brake pad and rotor. Loosen the castle nut to increase the clearance.

There should be equal space on both sides of the rotor.

7 Replace the hair pin cotter in the castle nut.

Note: Cycle the brake to verify the brake pads release far enough so they do not touch the rotor. If the pads touch the rotor during a run, the information provided by the dyno will be inaccurate.

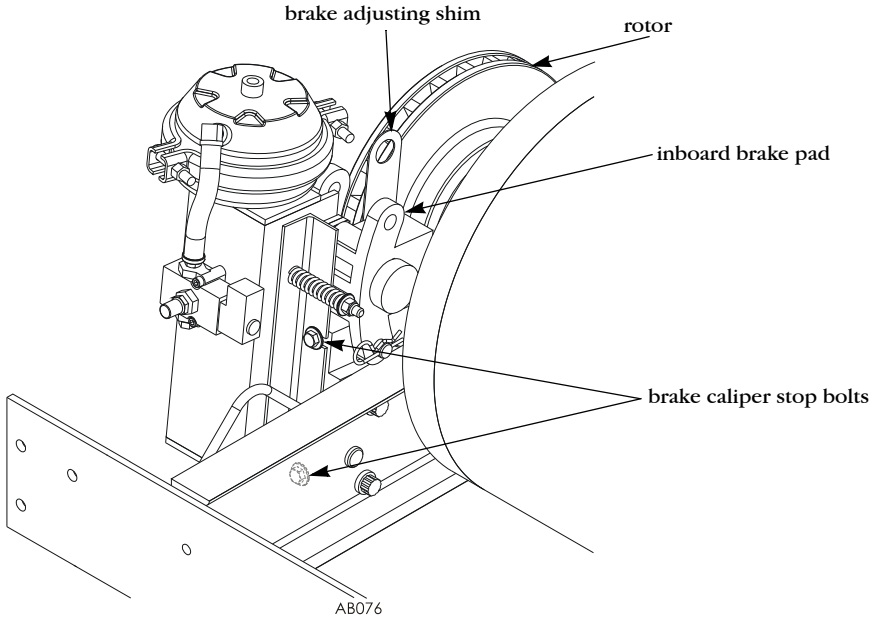


Figure 3-18: Adjust the Brake Pad Clearance

COMPRESSED AIR PUMP ASSEMBLY

Refer to the Air Fuel Ratio Module and AFR-4 Pump Assembly Installation and User Guide (P/N 98200006) for proper operating and maintenance procedures. Refer to the Flow Meter User Guide (P/N 98129104) to test your air pump for accuracy. Failure to follow proper procedures may result in inaccurate data or damage to the equipment. These manuals can be found on your WinPEP CD or at www.dynojet.com.

WARNING

The sensor and the copper sample tube are hot. Before touching the sensor or the sample tube, make sure it has cooled.

CAUTION

Leaded racing fuels and two-stroke applications will contaminate the sensor and dramatically shorten its service life.

The sensor is not covered by a warranty. Be sure to read and understand the Air Fuel Ratio Module and AFR-4 Pump Assembly Installation and User manual.

Before turning the pump on, verify there is no water in the hose.

Warm up the vehicle before placing the copper sample tube in the exhaust to avoid drawing excess water through the pump assembly.

Keep the air pump assembly upright. Tipping the pump assembly may result in damage to the sensor.

Leaks in the system will result in erroneous readings. Verify there are no cracks or holes in the hose. Verify the sensor is seated properly in the sensor block.

To ensure accurate readings, pump maintenance should be performed every six months, or sooner, depending on usage. Refer to the Air Fuel Ratio Module and AFR-4 Pump Assembly Installation and User Guide for more information.

WHEEL CLAMP

The wheel clamp allows you to easily adjust for various wheel thicknesses with the press of a button. Refer to “Using the Wheel Clamp” on page 4-6 for more information on using the wheel clamp.

You will need the following part:

- 71329000 Wheel Clamp
  includes:
  DM150-002-004 Washer, 5/16", Lock (4)
  DM150-002-007 Washer, 5/16", Flat (4)
  DM150-019-012 Bolt, 3/8-16 x 1", Hex (4)

INSTALLING THE WHEEL CLAMP

1 Remove the six 1/4-20 x 1-inch screws securing the wheel clamp cover. Remove the cover and set the cover and screws aside.

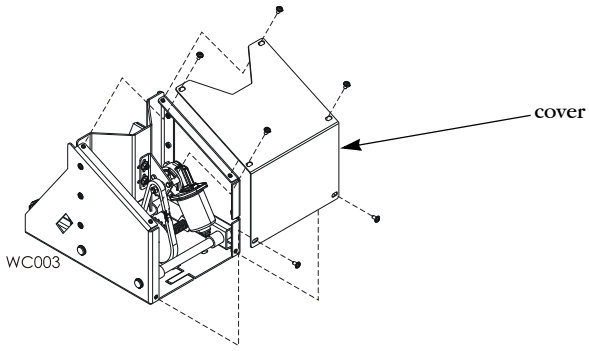


Figure 3-19: Remove the Wheel Clamp Cover

2 Place the wheel clamp on the carriage. Align the four holes on the wheel clamp with the holes on the carriage.

3 Secure the wheel clamp to the carriage using four 3/8-16 x 1-inch bolts, four 5/16-inch lock washers, and four 5/16-inch flat washers.

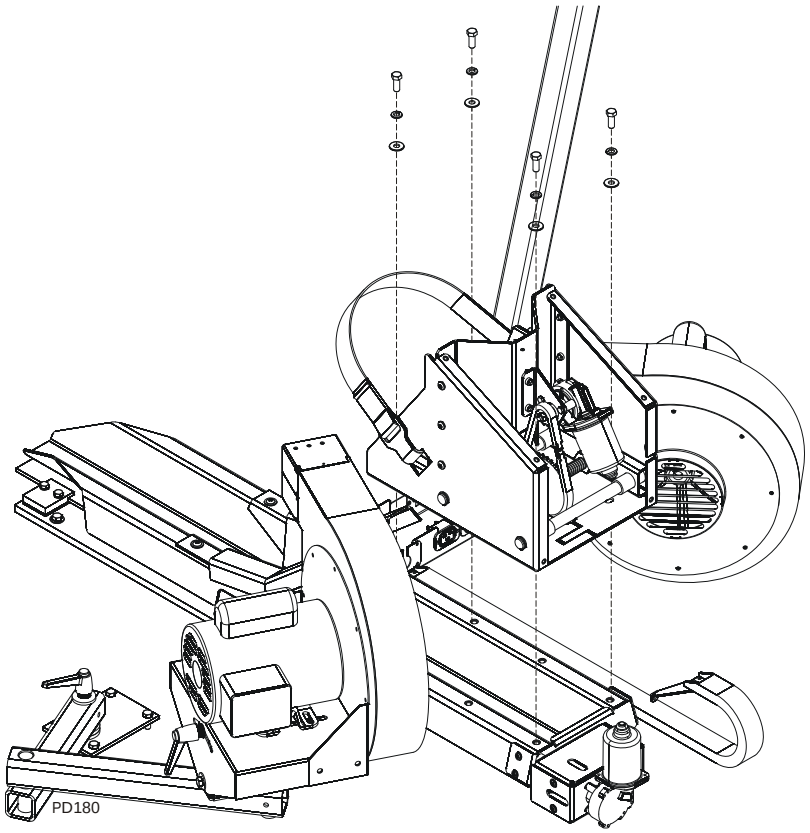


Figure 3-20: Secure the Wheel Clamp to the Carriage

4 Bring the wheel clamp cable (three-pin connector) from the cable track over to the wheel clamp. This cable was routed on page 2-37.

5 Install the wheel clamp cable strain relief to the side of the wheel clamp.

6 Plug the wheel clamp cable into the connector on the wheel clamp motor.

7 Replace the wheel clamp cover.

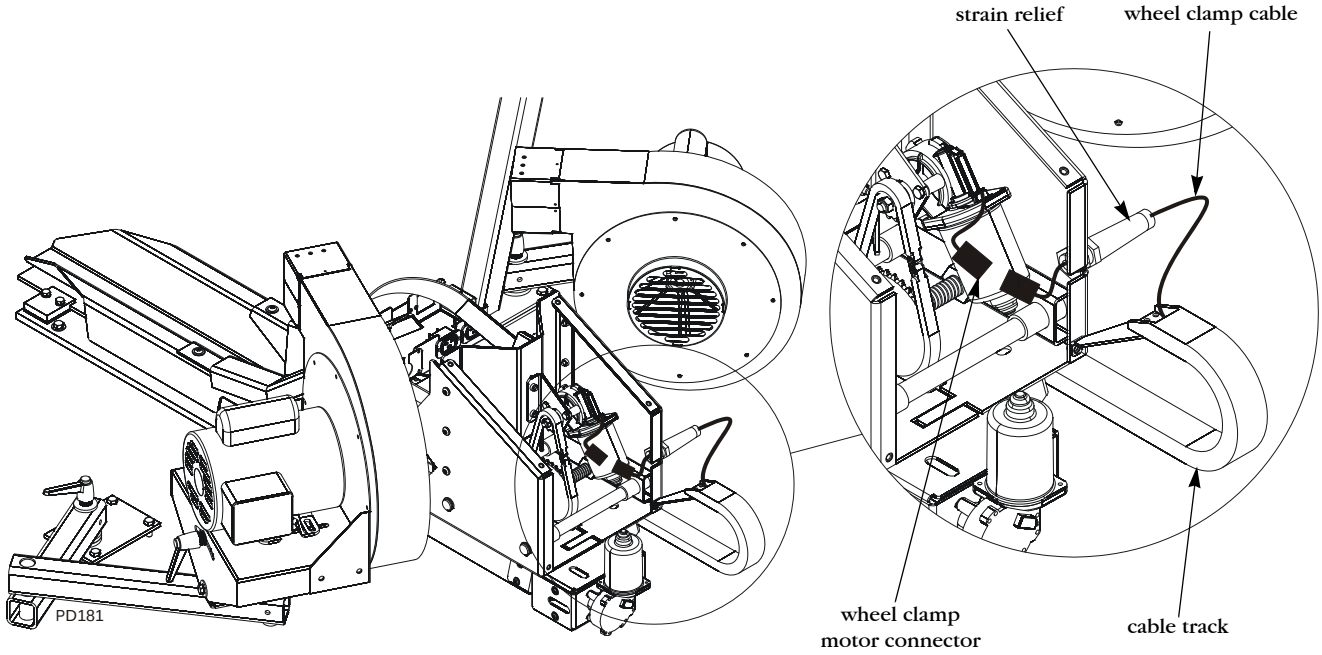


Figure 3-21: Secure the Strain Relief and Cable

8 Place the wheel clamp cover on the wheel clamp.

9 Secure the cable track to the wheel clamp as shown in Figure 3-22 using one 1/4-20 x 1-inch screw removed earlier.

10 Secure the wheel clamp cover using the remaining five 1/4-20 x 1-inch screws removed earlier.

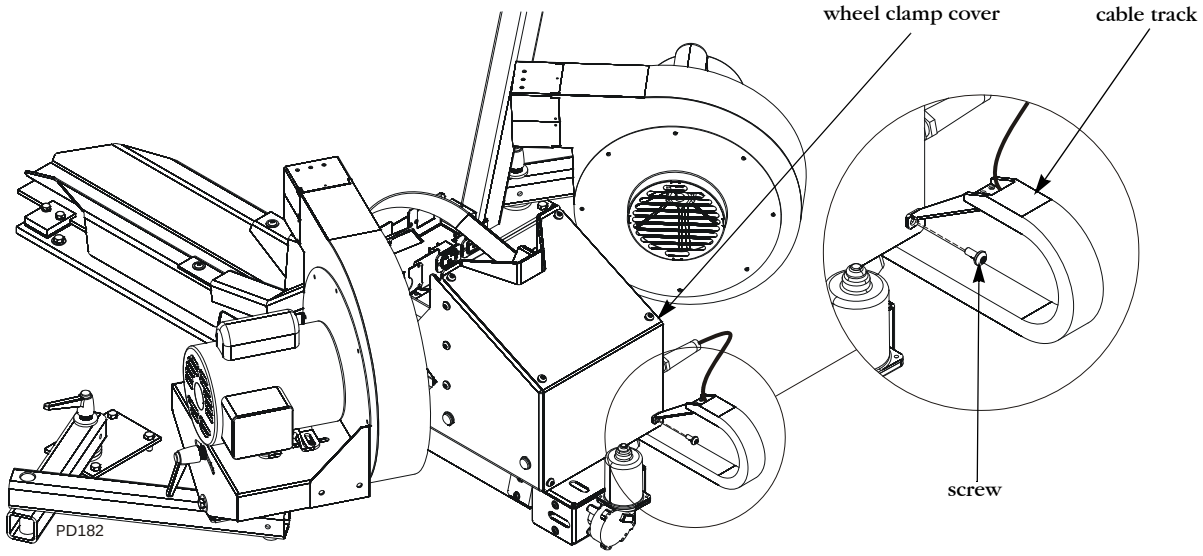


Figure 3-22: Install the Cable Track

Wheel Clamp Final Adjustments and Tests

1 Place a stack of catalogs into the wheel clamp.

2 Using the Control Panel, press the close button and observe that the wheel clamp does close. Hold the button until the motor turns off and the status light is on steady.

3 Press and hold the right hand wheel clamp button then press the left hand button to open the clamp.

Refer to “Using the Wheel Clamp” on page 4-6 for more information on using the Control Panel.

CHAPTER

4

CONTROL PANEL INTERFACE OPERATION

This chapter will walk you through the basic operating procedures and how to maintain and troubleshoot the components associated with the Control Panel Interface (CPI). To ensure safety and accuracy in the procedures, perform the procedures as they are described.

This chapter is divided into the following categories:

- Basic Operation, page 4-2
- Power Distribution Assembly, page 4-8
- Maintenance and Troubleshooting, page 4-9

BASIC CPI OPERATION

The control panel may be mounted to either side of the tray for easy access by the dyno user while seated on the bike. The graphics on the control panel are grouped together according to function and color coded for ease of identification.
A description of the functions and displays follows:

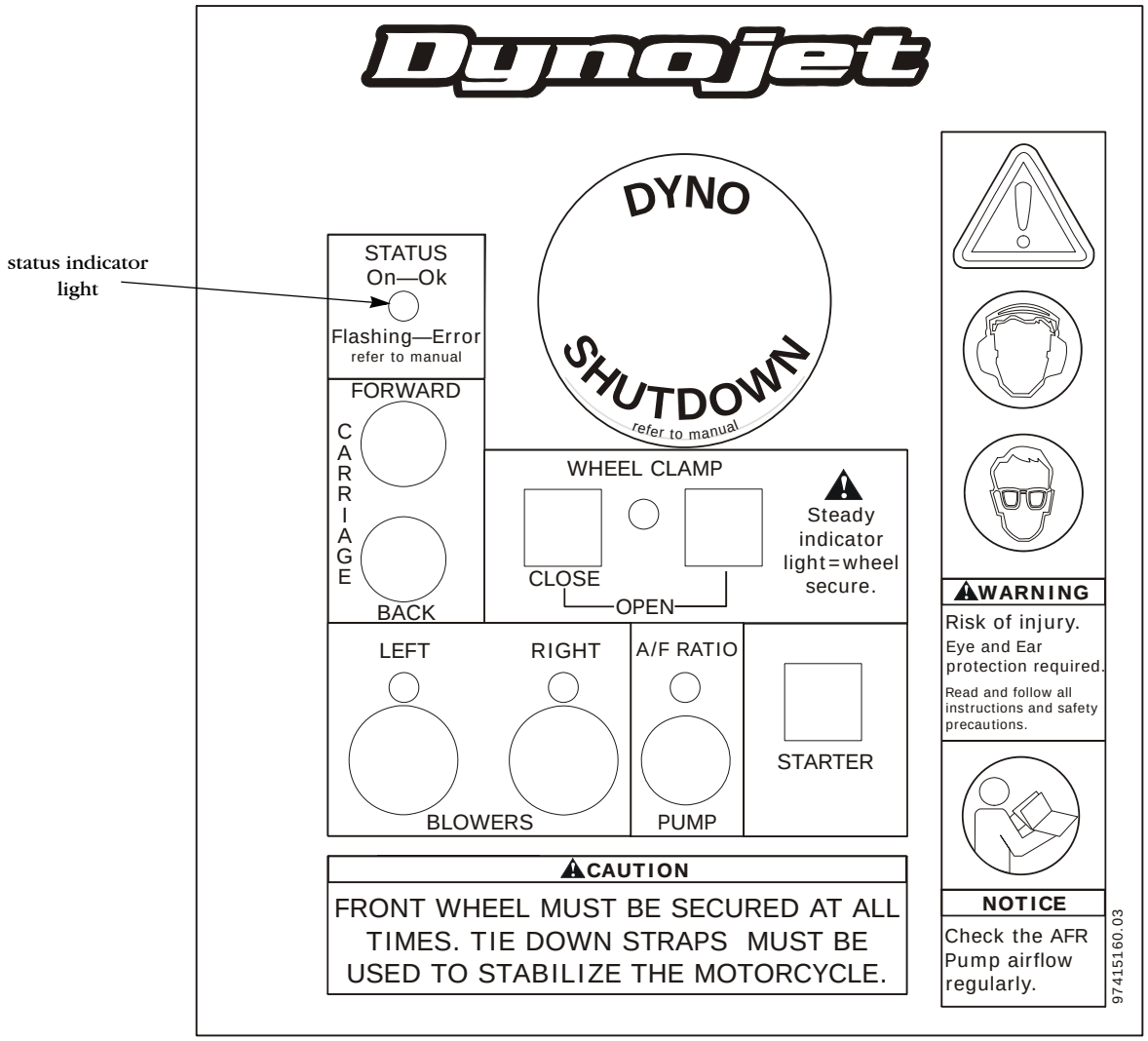


Figure 4-1: Control Panel Features

control panel feature	description
Air Fuel Ratio Air Pump	This optional accessory allows control of the internal air pump of the air fuel ratio sampling system. Refer to page 4-3 for more information.
Emergency Stop/Dyno Shutdown	Deactivates the dyno outputs whenever the button is pressed or the external E-Stop circuit is opened. Refer to page 4-4 for more information.
High Pressure Blowers (Blowers)	This optional accessory allows you to toggle the blowers on and off to control the temperature of the bike. Refer to page 4-4 for more information.
Power Carriage	This accessory requires the CPI and battery to operate. The power carriage allows you to move the bike forward and backward by remote control to center the bike's rear tire on the dyno drum. Refer to page 4-5 for more information.
Starter	Allows for spinning up the dyno drum to bump start bikes that may not have a starter. Refer to page 4-5 for more information.
Status Indicator	Provides information on the status of the CPI control and the various inputs to the CPI.
Wheel Clamp	This optional accessory requires the CPI and battery to operate. The wheel clamp allows for quicker loading and unloading of the bike. Refer to page 4-6 for more information.

USING THE AIR FUEL RATIO AIR PUMP

The CPI allows control of the optional internal air pump that is part of the air fuel ratio (AFR) sampling system. This air pump is built into the dyno to draw exhaust gases over the AFR sensor. The button on the control panel allows the dyno user to turn this pump on and off. The indicator light on the control panel will illuminate when power is provided to the pump.

If the pump does not run, check the following:

- Verify the switch on the pump assembly is on.
- Verify fuses F3 and F4 on the CPI board.
- If the E-Stop button is pressed or the external E-Stop circuit is open then the AFR pump will not run.

Refer to the Air Fuel Ratio Module Installation and User Guide for proper operating and maintenance procedures (P/N 98295110). Failure to follow proper procedures may result in inaccurate data or damage to the equipment. This manual can be found on your WinPEP CD or at www.dynojet.com.

USING THE EMERGENCY STOP/DYNO SHUTDOWN

The emergency stop/dyno shutdown button is designed to deactivate the dyno outputs whenever the button is pressed or the external E-Stop circuit is opened. When E-Stop is activated the blowers will be turned off, the power carriage will stop, and the wheel clamp will stop. The starter will be deactivated as well as the AFR air pump and the retarder will be de-activated. If the dyno is properly equipped with the air brake option, the air brake will be applied stopping the dyno drum. If the air brake is not installed the drum will freewheel. During an E-Stop condition the Status Indicator light will be flashing with two short blinks on and long pause off.

USING THE HIGH PRESSURE BLOWERS

The CPI allows the dyno operator to toggle the optional high pressure blowers on and off from the control panel. If the E-Stop is activated the blowers will be automatically turned off. The indicator light by each button will light up when that blower output is turned on. If the toggle switch on the blower is turned off the blower will not operate even if the CPI output is on.

CAUTION

The blower outlets on the front of the dyno are designed to only work with Dynojet provided blowers. Connecting other electrical loads or other blowers to the outlets on the dyno may damage the dyno and void the warranty.

If the blower indicator light on the control panel is on but the blower is not running, perform the following steps.

1 Verify the switch on the blower is on.
2 Verify the blower power plug is firmly plugged into the dyno.
3 Verify the blower circuit breakers in the CPI.

   If the button on the breaker is extended, an overload has occurred and the breaker has tripped. Press in the breaker button to reset the breaker. If the breaker continues to trip, contact Dynojet.

UNDERSTANDING INTERLOCKS

The interlock circuit provides inputs for normally closed switches which open when it is not safe to run the dyno. Typically these switch inputs will be tied to safety gates and safety switches that are required in Europe. If the Interlock circuit is open the Status Indicator light will blink on and off with the on time equal to the off time. This will continue until this circuit is closed or an overriding E-Stop condition is sensed. In a dyno configured to comply with CE requirements the interlock signal will activate the drum air brake.

USING THE POWER CARRIAGE

This accessory requires the CPI and battery to operate. Use the control panel to activate the power carriage allowing you to center the bike's rear tire on the dyno drum.

The power carriage and wheel clamp cannot be activated at the same time.

Note: When operating the power carriage with a bike on the dyno, make sure the bike is in neutral.

Note: Always loosen or remove the bike tie-down straps before moving the carriage. Replace and tighten the straps when the bike is in the proper position.

Never perform a dyno run if the tie-down straps are not in place or they are damaged.

If the carriage movement is slow during parts of its travel, investigate and correct the source of the problems. If you reach the end of travel of the carriage or the carriage binds and you continue to hold down the carriage movement button, the motor will draw too much current and blow the carriage fuse F2. There is a short time delay built into the button operation to allow the carriage motor to coast to a stop before it moves in the opposite direction. This delay is needed to prevent the motor from drawing too much current by rapidly reversing the motor.

USING THE STARTER

The built-in starter allows you to use the momentum of the drum to start motorcycles that are not equipped with an on-board starting system. The starter requires a battery to operate. Refer to page 2-29 for more information on the battery.

If the E-Stop button is pressed, the starter will not engage. If the interlock circuit is open, the starter will not operate.

1 Make sure the dyno brakes are not activated.
2 Verify the bike is in neutral or disengage the clutch.
3 Press and hold the green starter button until the drum reaches maximum speed.
4 Release the green starter button.
5 Use the momentum of the drum to start the bike.

Note: Do not re-engage the starter while the drum is turning.

Using the Status Indicator

The status indicator provides information on the status of the CPI control and the various inputs to the CPI.

- Status: Off—indicates the CPI may not be receiving power due to the dyno being turned off or lack of power being applied to the dyno.
- Status: Steady On—indicates all inputs into the CPI are okay for normal dyno operation and the CPI is receiving power.
- Status: Blinking—If the status indicator light is flashing with two short blinks on and a long pause off, the Emergency Stop circuit is open. This can be caused by the red button on the control panel being pressed or an external E-Stop (Emergency Stop) condition is being fed to the CPI board. The E-Stop circuit must be closed to allow for normal dyno operation.
- Status: Blinking—If the status indicator light is blinking with equal on and off time, the interlock signal into the CPI board is open. This signal monitors the condition of optional safety switches that will be attached to safety guards or the dyno room door when guards are not used; this will allow dyno operation only when the guards are in place or the door is closed. The E-Stop circuit takes precedence over the interlock input.

Using the Wheel Clamp

This optional accessory requires the CPI and battery to operate. The wheel clamp allows for quicker bike loading and unloading. The internal mechanism in the wheel clamp closes on the bike's front wheel and tire to a calibrated amount of pressure securing the bike. The indicator light between the wheel clamp buttons provides status of the current state of the wheel clamp.

Pinch hazard. Keep hands, body parts, and other loose items clear. Failure to follow these instructions can result in serious injury or equipment damage.

Risk of injury. Be sure the wheel clamp is free and clear of any obstruction. Do not operate the dyno if the wheel clamp indicator light is not on steady.

CLOSING THE WHEEL CLAMP

CAUTION

Do not run into the edges of the wheel clamp pads with the bike tire. Make sure the wheel clamp is sufficiently open before loading the motorcycle.

1 Once the bike's front tire is fully seated in the clamp, press and hold the close button (left hand yellow square button).

As you hold the button, the wheel clamp mechanism will close on the bike's wheel and tire. The wheel clamp status light will blink as the clamp is closing.

WARNING

For proper and safe operation, the wheel clamp must grip the wheel as well as the tire. If the front tire is too wide to allow the clamp pads to grip the wheel, you must use the wheel strap.

2 Continue to hold the button down as the clamp applies pressure to the wheel and tire. During this process, the CPI is monitoring the current that is going to the wheel clamp.

When the wheel clamp has reached sufficient clamping force to secure the bike, the current drive to the wheel clamp is cut and the wheel clamp indicator light will turn on steady indicating that the wheel is secured.

WARNING

Do not operate the dyno if the wheel clamp indicator light is not on steady.

3 Pull back on the bike to verify the bike is secured.

4 Adjust the carriage to align the rear bike tire on the dyno drum.

5 Secure the bike with the tie-down straps.

WARNING

Never perform a dyno run if the tie-down straps are not in place or they are damaged.

OPENING THE WHEEL CLAMP

1 Press and hold the right hand yellow square button first, then press the left hand yellow button. The wheel clamp will start opening.

The status indicator light will be blinking to indicate the wheel is not secured and a dyno run should not be attempted.

2 Continue to open the clamp far enough to allow the next bike to be loaded easily.

POWER DISTRIBUTION ASSEMBLY

The Power Distribution Assembly, inside the CPI, has three circuit breakers to protect the internal dyno circuits, the main dyno circuit breaker and two blower circuit breakers.

Main Circuit Breaker

The main circuit breaker is rated for 240VAC at 30A and all of the power into the dyno passes through this breaker. In the event of a major overload or failure this breaker will trip. This breaker also provides the main disconnect for the dyno. When the handle is in the up position the dyno is connected to the incoming power. When the handle is in the down position all power into the dyno is turned off.

WARNING

Even if this breaker is turned off there is still the potential for lethal voltages to be present in the CPI. Always disconnect the main power plug before removing the covers.

High Pressure Blower Circuit Breakers

The high pressure blower (blower) circuits are protected by the two 15A breakers. In the event of a motor failure or other failure with the blowers these breakers could trip. The white button pops out to indicate the circuit has tripped. Pressing in the white button will reset the breaker. The top breaker protects the right blower circuit (right side of dyno as you are sitting on the bike) and the bottom breaker protects the left blower circuit. These breakers do not provide a manual disconnect.

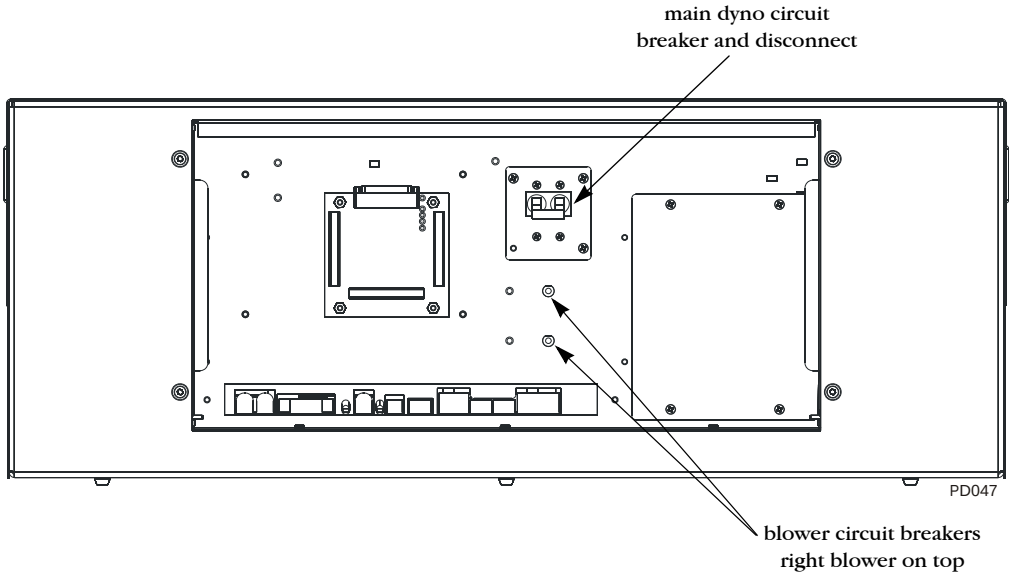


Figure 4-2: CPI Circuit Breakers

MAINTENANCE AND TROUBLESHOOTING

This section contains basic maintenance and troubleshooting information for the wheel clamp, theta controller fuses and CPI fuses.

MAINTAINING AND TROUBLESHOOTING THE WHEEL CLAMP

- Make sure the bike tire and wheel are clean to reduce the possibility of scratching the rim.
- Keep the wheel clamp pads clean using Isopropyl Alcohol. Do not allow any products to be applied or transferred to the wheel clamp that could interfere with the gripping action.
- If you run the clamp all the way open against the hard stops, the CPI will turn off the motor before any damage can occur.
- Follow the prescribed service for the wheel clamp lubrication for frequency and type of lube. Grease or lube the screw and slides monthly or every 500 bikes.
- Do not run into the edges of the wheel clamp pads with the bike tire.
- If the wheel clamp movement is binding for any reason, stop using the wheel clamp and correct the problem. It is possible for the wheel clamp to bind and give a false indication that the wheel is clamped.
- If the wheel has been clamped and the wheel clamp indicator light is on steady then the dyno power is turned off or the E-Stop activated, the wheel clamp indicator light will go back to the blinking state as the clamp status is unknown. Pressing the clamp button again will secure the clamp.
- If the E-Stop circuit is open or the Emergency Stop button is pressed, the wheel clamp will not operate.

Replacing the Theta Controller Fuses

WARNING

Hazardous voltage. To avoid risk of electrical shock, disconnect the battery and unplug the dyno.

1 Remove the Control Panel Interface (CPI) cover and set aside. Refer to "Accessing the CPI" on page 2-31.
2 Gently push the fuse holder slightly inward and rotate counterclockwise. Remove the fuse holder.
3 Replace the fuse with a fuse type listed below.
4 Replace the CPI cover using the eight button-head screws removed earlier.

CAUTION

For continued protection against risk of fire, replace only with a fuse of the same type and having the same electrical rating.

240V Theta Controller Fuses	120V Theta Controller Fuses
• Buss P/N BAF-15, 15A Fuse	• Buss P/N BAF-25, 25A Fuse
• Little Fuse, KLK 15	• Fast Blow, Dynojet P/N 54212501
• Fast Blow, Dynojet P/N 54211501	

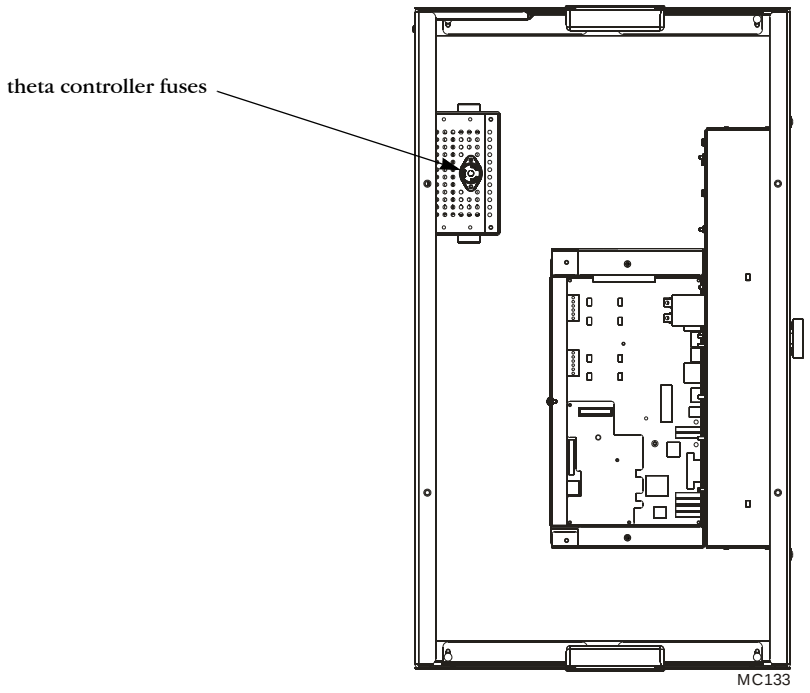


Figure 4-3: Theta Controller Fuses

TROUBLESHOOTING CPI FUSES

Fuses F3 and F4 fuse the 240VAC as it enters the CPI board. One fuse is used for each leg of the 240VAC. If either of these fuses are blown there will be no power to the CPI board or any of the accessories. The Status Light on the board as well as the button panel will be off. Replace with a 5x20 mm 3A fast blow fuse.

Fuse F5 provides protection for the DC power that is produced by the on board power supply and routed to the CPI board. If this fuse is blown there will be no power to the CPI board or any of the accessories. The Status Light on the board as well as the button panel will be off. Replace with a 5x20 mm 3A fast blow fuse.

Fuse F6 provides protection for the power that is provided for the 12VDC accessories from the dyno owner installed car battery. This also protects the charging circuit to the battery. If this fuse is open the power carriage and the wheel clamp will not function. Replace with a 15A mini auto fuse.

Fuse F1 protects the wheel clamp drive circuit. If this fuse is open the wheel clamp motor will not activate. Replace with a 15A mini auto fuse.

Fuse F2 protects the power carriage drive circuit. If this fuse is open the power carriage motor will not activate. Replace with a 15A mini auto fuse.

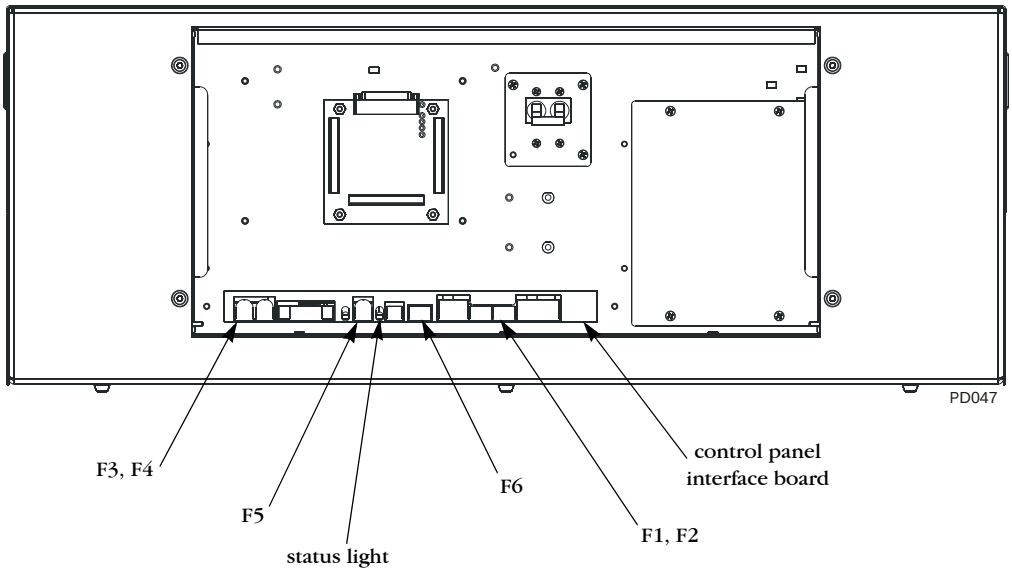


Figure 4-4: CPI Fuses

CHAPTER

5

BASIC DYNO OPERATION

This chapter includes instructions for basic dyno operation. For more detailed instructions, refer to your WinPEP 7 User Guide. This manual can be found on your WinPEP CD or at www.dynojet.com.

This chapter is divided into the following categories:

- Loading the Motorcycle, page 5-2
- Connecting the RPM Pickup, page 5-5
- Pre-Run Inspection, page 5-10
- Making a Test Run, page 5-12
- Preventative Maintenance, page 5-13

LOADING THE MOTORCYCLE

Use the following steps to load a motorcycle on the dyno.

WARNING

Keep the motorcycle balanced while driving on and off the dyno.

WARNING

Risk of injury. Always wear proper eye and ear protection when operating the dyno.

1 Load the motorcycle on the dyno.

2 Place the bike on the dyno so the front tire is in the tire stop.

3 Strap the front wheel to the tire stop and tighten.

Note: If you have the wheel clamp, use the control panel to secure the front wheel.

WARNING

Never perform a dyno run if the tire strap is not in place or is damaged.

4 Use the control panel to run the power carriage until the rear axle is aligned with the center of the drum.

5 With the motorcycle in neutral, align the wheel in the center of the knurl. If you have a battery installed, you may align the wheel by pressing the dyno starter switch.

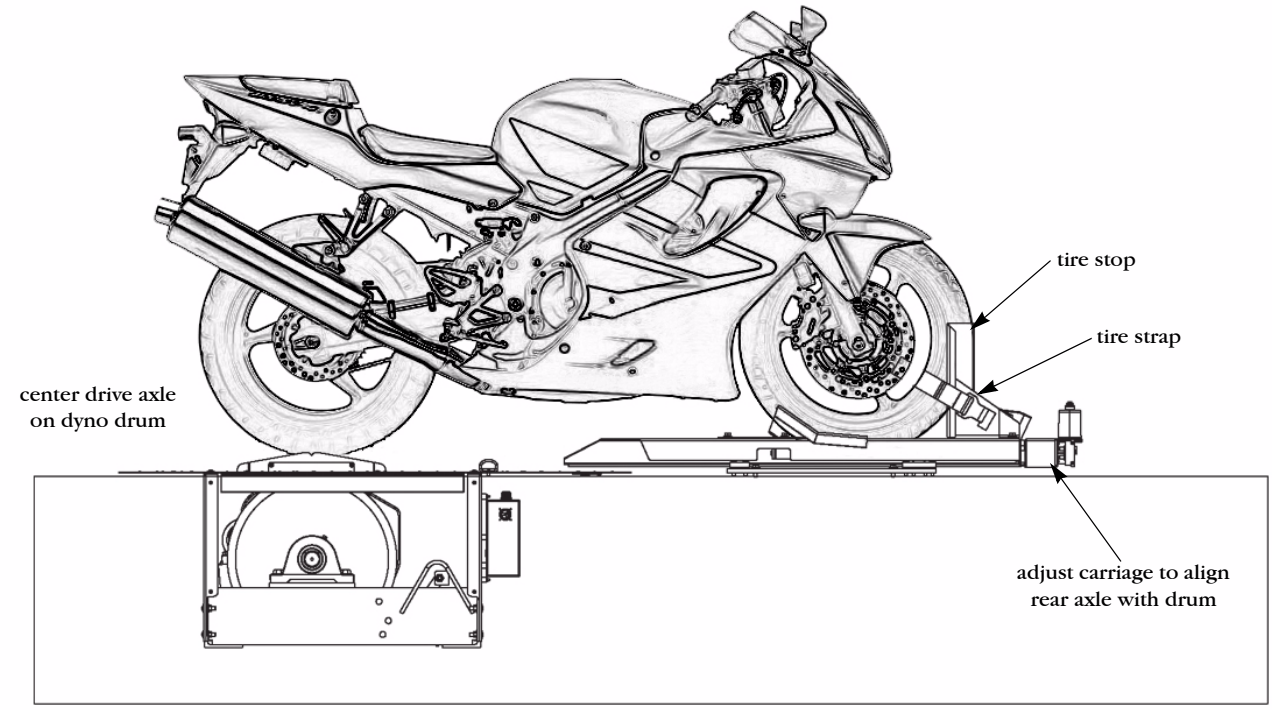


Figure 5-1: Align the Wheel and Axle

6 Attach the tie-down straps from a solid place on the bike to the tie-downs on the dyno or the ground hook locations. Position the straps to allow proper clearance for the brake pedal, the shift lever and the exhaust pipes. For best results, hook the straps at the rear of the bike so they pull down and forward.

7 Sit on the bike with your feet on the pegs. Remove the slack from the straps. Gently shift your weight from side to side while tightening the straps, being careful to not overtighten the straps. The straps are used to stabilize the bike. They should not add any additional vertical force to the bike.

WARNING

Never perform a dyno run if the tie-down straps are not in place or they are damaged.

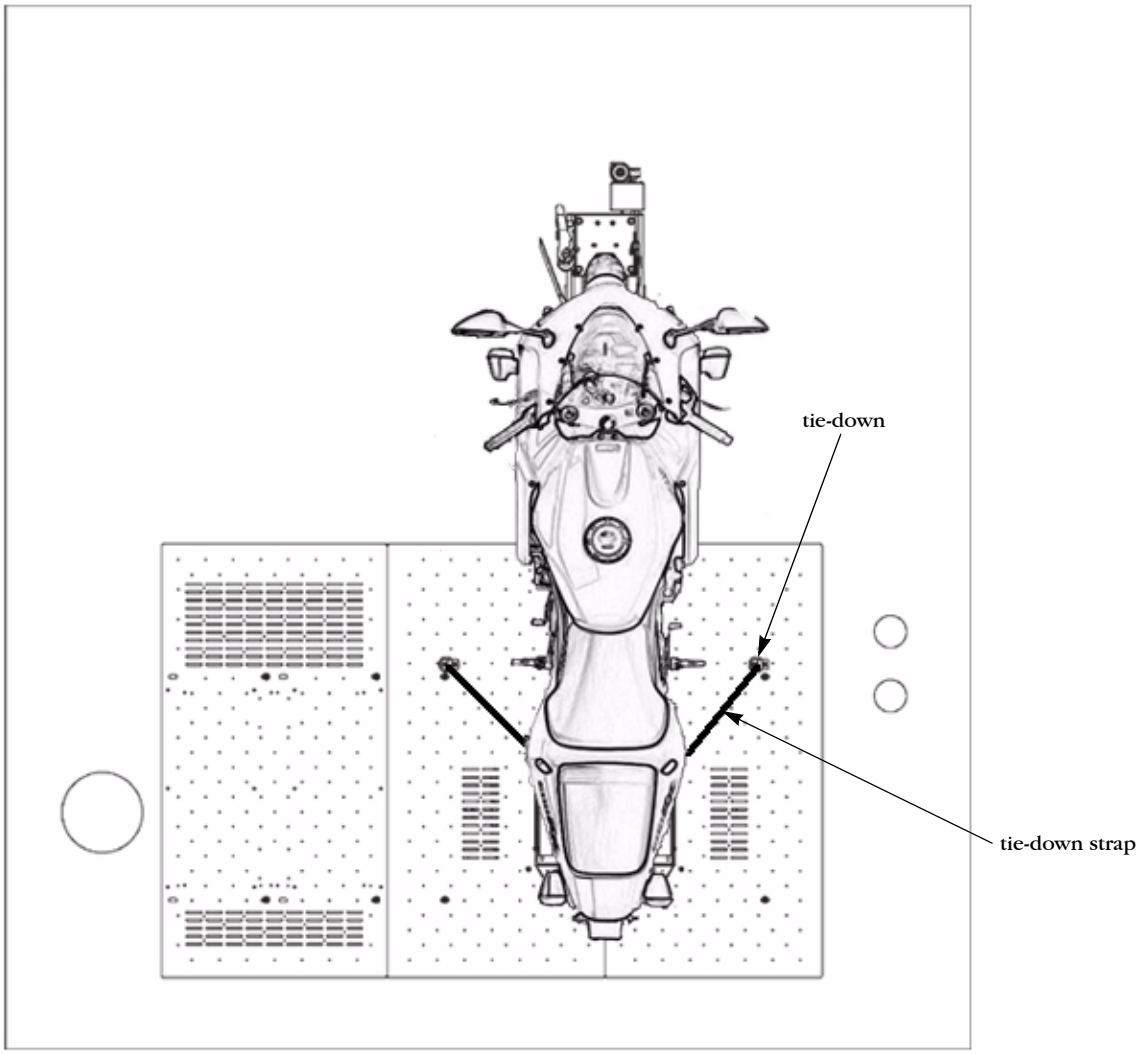


Figure 5-2: Attach the Tie-down Straps

CONNECTING THE RPM PICKUP

Your Dynojet dynamometer includes a primary wire inductive pickup and two secondary wire inductive pickups. These small “clothespin like” inductive pickups are used to sense RPM. An RPM pickup is required if you want to view torque graphs. Generally you will use one secondary wire inductive pickup on a spark plug wire. Vehicles with wasted spark ignition systems may require two secondary inductive pickups. On a wasted spark ignition, typically one coil will be connected to two spark plug wires. Attach one secondary pickup to each of these wires. If the pickups are connected to two plug wires that do not fire at the same time, an erratic RPM readout may occur. The primary wire inductive pickup senses RPM pulses from the coil. Although this pickup location generally works better, it is harder to find the correct location to connect the RPM pickup.

Note: If a pickup is not being used, disconnect it from the dyno electronics to prevent any stray pick up of signals.

CAUTION

Inductive pickups are very fragile. The ferrite core can easily be damaged and is not covered under warranty. Dropping, snapping, vibration, and heat can all damage the ferrite core.

The dyno electronics RPM module contains the electronics that sense the RPM pulses. An auto-gain circuit looks at only the peak voltage of the vehicle’s spark, ignoring the lower voltages to help reduce electronic noise problems. Wasted spark ignition systems will produce a lower voltage level on the exhaust stroke than the compression stroke. By definition of the auto-gain circuit, lower voltage spark levels will be ignored, missing every other spark the vehicle would produce.

RPM Pickup Descriptions

RPM pickup	description
Secondaries (Non- wasted spark system)	Use one secondary pickup. Unplug the other pickup from the RPM module and set the degrees between plug fires to 720° in WinPEP 7.
Secondaries (Wasted spark ignition system)	Use two secondary pickups. Attach one pickup on each spark plug wire on the same coil and set the degrees between plug fires to 360° in WinPEP 7.
Primary pickup	Attach the primary wire pickup to the primary side of the coil. Set the degrees between plug fires by taking 720/number of cylinders. For example, the number of degrees between plug fires on a V-8 engine with a single coil is 720/8=90 degrees.

CONNECTING THE PRIMARY INDUCTIVE PICKUP

The primary inductive pickup cannot be in contact with, or it's connecting wire be crossing, other engine electrical wires or stray RF interference may result.

You will need the following part:

- DE100-110L Primary Inductive Pickup

1 Clip the primary inductive pickup to the primary wire of the coil opposite the battery source.

2 Route the primary wire cable to the RPM Module making sure the cable is clear of devices that produce electronic noise (spark plug wires, coil wire, coil etc.).

Note: You must ground the vehicle to the dyno for the electronics to function properly.

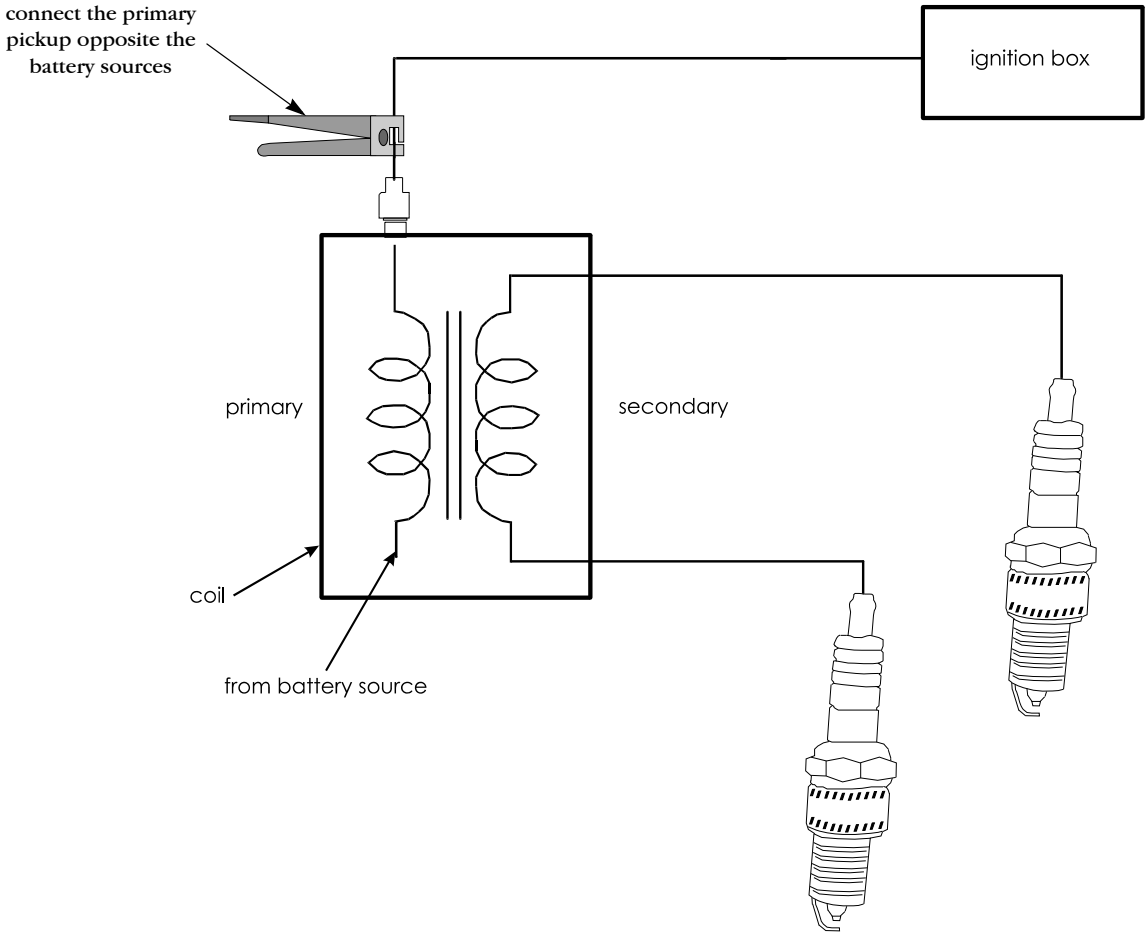


Figure 5-3: Tachometer Pickup Primary Inductive

Depending on accessibility, the user can make a primary wire hookup from the coil or the ignition module. Ignition modules can be found usually under the seats or side covers. Refer to the following table to determine the wire color when hooking up the inductive tack lead to the primary side of the ignition.

make	**wire color**
BMW R Models	Black
BMW K Models	Black/Blue Black/Red
BMW Triplets	Black/Green
Buell	Pink
Ducati	Gray or Green/Brown
EFI	Green or Violet/Yellow
Harley	Blue or Pink
Honda	Yellow or Yellow/Blue
Kawasaki	Green
Suzuki	White or Black/Blue
Triumph	Brown/Yellow Yellow/Blue Green/Black Black/Green
Yamaha	Orange or Gray

CONNECTING THE SECONDARY INDUCTIVE PICKUP

If the primary wire is not accessible connect a secondary inductive pickup to an available spark plug wire. The secondary inductive pickup cannot be in contact with, or it's connecting wire be crossing, other engine electrical wires or stray RF interference may result.

You will need the following part:

- DE100-109S Secondary Inductive Pickup (2)

1 Clip the secondary inductive pickup around one spark plug wire.

2 Route the inductive pickup cable to the RPM Module making sure the cable is clear of devices that produce electronic noise (spark plug wires, coil wire, coil etc.).

Note: Inductive pickup placement is important. Position the inductive pickup so that it is not making contact with any other spark plug wires. Separate the spark plug wire from the spark plug wire bundle for proper operation.

Note: You must ground the vehicle to the dyno for the electronics to function properly.

Note: When using one secondary pickup, disconnect the other pickup from the dyno electronics.

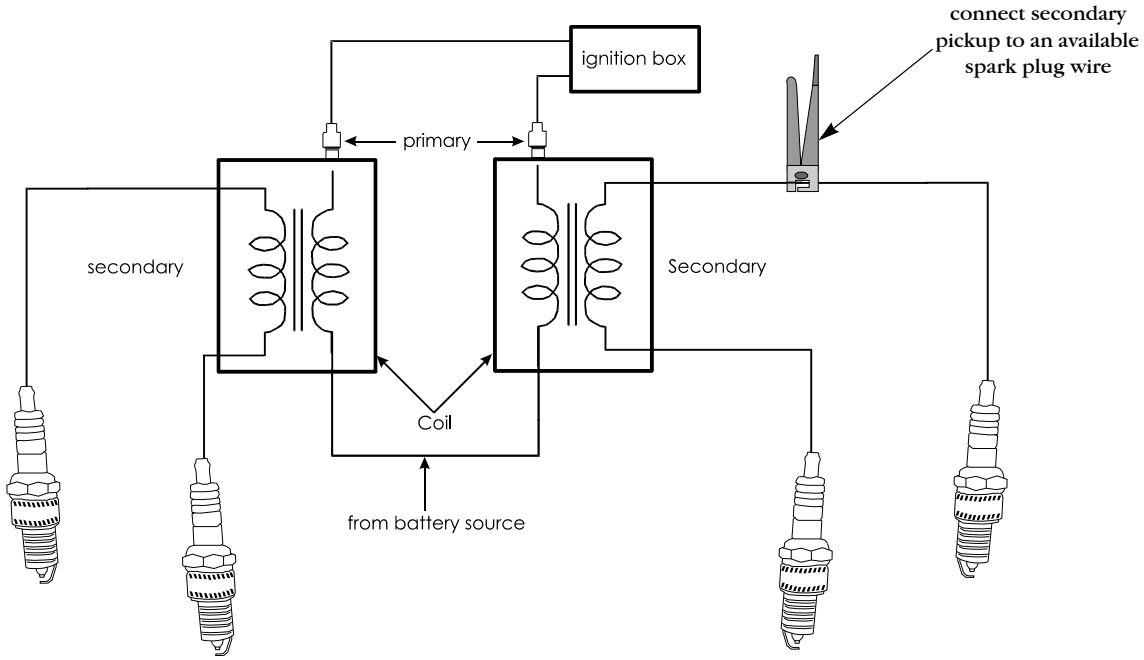


Figure 5-4: Tachometer Pickup Secondary Inductive

Erratic tachometer operation can be caused by Electro Magnetic Interference (EMI). The following are some steps that the user can take to clean up the signal if an EMI situation occurs.

- Ground the computer case to a good earth ground, like the receptacle box.
- Keep the computer as far away from the dyno as possible.
- Try attaching one secondary inductive cable to one wire and attach a second inductive cable to the first in a piggy back fashion. The first inductive cable acts as a filter.
- Using a jumper wire, ground the metal case of the inductive clip to the motorcycle chassis.

Rout the inductive wire(s) 90 degrees (perpendicular) away from the motorcycle. When laid alongside (parallel) to the motorcycle they can act as an antenna.

PRE-RUN INSPECTION

Perform a vehicle inspection before making a run. Check the following:

- Check the radiator coolant (if applicable) and oil levels.
- Check the fuel source.
- Rotate the drum and check for rocks caught in the tire tread that could fly out.
- For motorcycles, check the chain and the chain master link. Make sure it is lubricated and adjusted to the proper tension.
- Check the tire pressure and tire speed rating. Improperly inflated tires or exceeding the maximum speed rating can result in premature wear or severe tire damage. Make sure the tire has no major deficiencies (cracks in sidewalls, tread life, etc.).
- Visually inspect the vehicle. Make sure it is in safe running order.
- Make sure ear protection and safety glasses are used when the dyno is being operated.
- Check the tie-down straps to make sure that they are tight and secured.
- Check the drive tires to be sure that they are aligned correctly on the dynamometer's drums.
- Keep all rotating components clear at all times.
- Only the operator should be near the dyno or the vehicle during the test.
- Never allow any person(s) to stand behind the dyno or vehicle when it is being operated.
- Perform any other safety inspections appropriate to running your vehicle on the dyno.

WARNING

Never allow any person(s) to stand behind the dyno or vehicle when it is being operated. Only the operator should be near the dyno or the vehicle during the test.

BEFORE STARTING THE ENGINE

Connect an exhaust hose or hoses (if dual exhaust) on the vehicle, make sure the hose fits over the tail pipe, is not plugged or kinked and the hose is vented correctly out of the dyno room.

WARNING

Engine exhaust contains poisonous carbon monoxide gas. Breathing it could cause death. Operate machine in well ventilated area.

ENGINE WARM UP

Warm the vehicle's engine and drivetrain before beginning testing. Consistent engine temperatures will assure your runs are repeatable.

AFTER ENGINE WARM UP

Always leave the vehicle in neutral (automatic transmission) or in first gear (manual transmission), with the engine off, and make sure the park brake and the dyno brake are on when you get off the vehicle on the dyno.

- Fix any fuel, oil, or coolant leaks that may have shown up after engine warm up and check the carburetor for leaks.
- Any loud or unusual engine noises or excessive exhaust smoke should be resolved before continuing.

MAKING A TEST RUN

Dyno runs provide safe, reliable road testing right in the shop. The dyno allows you to measure, record, and diagnose performance problems quickly. The dyno combined with WinPEP 7 produces consistent, easily interpretable power graphs. Use the following instructions to ensure repeatable and accurate measurements.

1 Verify the vehicle is secured properly.

2 Place the vehicle in a low gear and release the dyno brake using the hand held pendant.

3 Slowly accelerate the vehicle to 20 mph.

4 Test the tachometer operation.

- 4a Rev the engine. The gauges on the computer screen should be moving. If the tachometer is moving but not registering the correct RPM values, the number of degrees of revolution of the crank shaft (the plug fires number) is incorrect.
- 4b Stop the vehicle, return to the MakeRun Configuration dialog box, and enter the correct value for the plug firing order.

5 Press the red brake button to apply 100% braking and slow down the vehicle.

CAUTION

Using the vehicle's own brakes to slow or stop the drum at speeds over 30 m.p.h. can severely over heat the brake parts. Dynojet dynamometers with the air brake or eddy current brake accessory can be used to slow the vehicle and drum to a full stop at any speed. The vehicle's brakes should be used in an emergency stop situation only.

6 Shut the engine off and put the vehicle in gear (manual transmission) or park (automatic transmission).

7 Set the vehicle's parking brake and leave the dyno brake on.

8 Perform a final inspection.

- Verify the drive tire's alignment on the dyno drums.
- Make any adjustments to the tie-down straps as needed.
- Perform any other safety checks that you deem appropriate to your particular situation.

You are now ready to make a high speed run on the dyno. Refer to your WinPep 7 User Guide for more detailed instructions.

PREVENTATIVE MAINTENANCE

This section contains basic preventative maintenance and troubleshooting information for the wheel clamp and CPI fuses.

To maintain proper dynamometer operation, Dynojet recommends you make routine checks of the dyno.

- Drum—keep the drum clean and keep all objects clear of the drum.
- Brake Pads—check the brake pad clearance regularly. Change the brake pads when they are worn to less than 0.060 inch thick.
- Air Pump Filter—clean the filter daily or more often depending on usage. Change the filter when necessary.
- Carriage Slide—keep the carriage slide and screw clean and lightly lubricated.
- Check all air fittings for leaks monthly. Correct any leaks found.
- Once per month verify that the drum brake pressure gauge reads 55 to 65psi [380 to 450kPa]. Adjust regulator if pressure is out of specification.
- Dyno Bearing Grease:

  Under steady use, over 25 runs per day, each bearing should receive .65oz of a recommended grease every 2 months.

  Under occasional use, less than 25 runs per day, each bearing should receive .65oz of a recommended grease every six months.

  Recommended Grease:

grease specification	description
thickener	Lithium 12 Hydroxy Stearate
oil	Petroleum
thickness	NLGI 2
operating temperature	-20°F to 200°F, intermittent to 250°F
EP additive	yes
examples	Mobil Mobilith AW-2

APPENDIX

A

RED HEAD ANCHOR INSTALLATION

This appendix contains instructions for installing the Red Head Multi-Set™ II Anchors. The anchors will be used to secure the dyno to concrete. To ensure safety and accuracy in the procedures, perform the procedures as they are described. Be sure to read and understand the warnings included in this appendix.

WARNINGS

WARNING

Always wear safety glasses and other necessary protective devices or apparel when installing or working with anchors.

CAUTION

ITW Ramset/Red Head Multi-Set II Anchors are designed to operate properly only when installed with ITW Ramset/Red Head brand Setting Tools.

The use of a 24 to 40 ounce hammer is recommended for expanding Multi-Set II anchors.

The use of carbide drill bits manufactured with ANSI B94. 12-77 drill bit diameter requirements is recommended for installation of this anchor.

Not recommended for use in lightweight masonry material such as block or brick.

Use of core drills is not recommended to drill holes for use with this anchor.

Not recommended for use in new concrete which has not had sufficient time to cure.

Anchor spacing and edge distance requirements (anchor installation locations) are the responsibility of the engineer of record.

CONTACT INFORMATION FOR ITW RAMSET/RED HEAD

Contact ITW Ramset/Red Head at 1-630-350-0370, or 1300 North Michael Drive, Wood Dale, IL 60191.

INSTALLATION

Use the table below to determine the catalog number, drill bit size, minimum hole depth, and setting tool catalog number.

catalog number	drill bit size	minimum hole depth	setting tool catalog number
Carbon Steel RM-38/RL-38 (9.5 mm)	1/2-inch	1 5/8-inch (41.2 mm)	RT-138

Use the following instructions to install the Red Head anchors.

1 Drill the hole in the concrete the same outside diameter as the anchor being used to any depth exceeding minimum embedment.

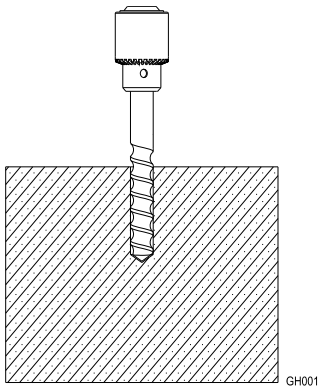


Figure A-1: Red Head Anchor—Drill the Hole

2 Insert the anchor.

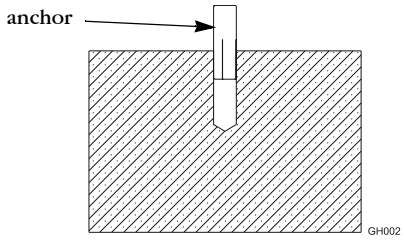


Figure A-2: Red Head Anchor—Insert the Anchor

3 Using a hammer, drive the anchor flush with the surface of the concrete, or below the surface if the hole depth exceeds minimum embedment.

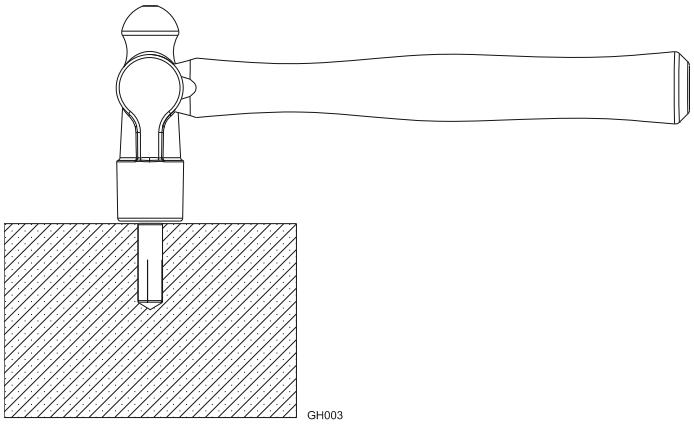


Figure A-3: Red Head Anchor—Drive the Anchor Flush

4 Using a hammer, expand the anchor with the setting tool. The anchor is properly expanded when the shoulder of the setting tool is flush with the top of the anchor.

Note: Use only Ramset/Red Head setting tools to insure proper installation.

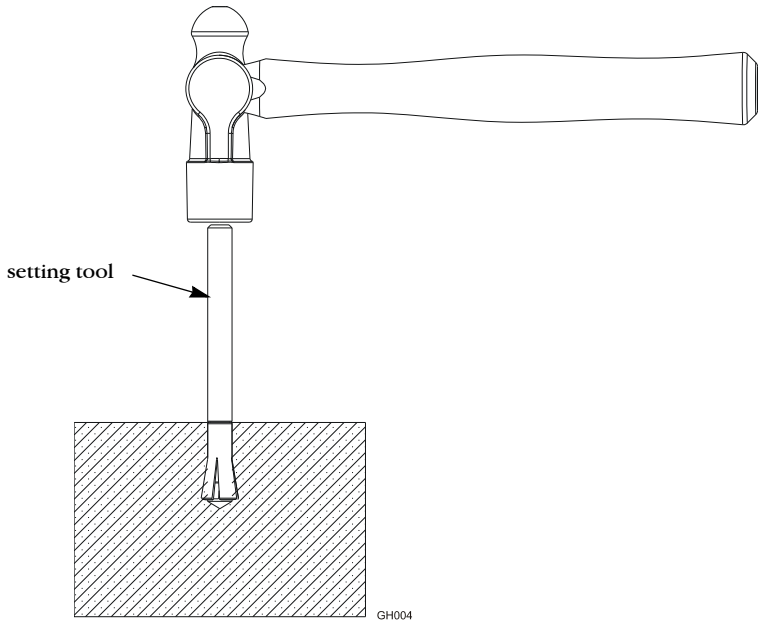


Figure A-4: Red Head Anchor—Expand the Anchor

APPENDIX

B

POWER REQUIREMENTS AND INSTALLATION

Different countries have different standards for delivery of AC (alternating current) electricity to homes and buildings. The frequency (number of cycles per second) in Hertz (Hz) varies from country to country.

North America typically uses 60 Hz power. Western Japan including the Osaka, Kyoto, Nagoya, Hiroshima regions also uses 60 Hz power. Eastern Japan including the Tokyo, Kawasaki, Sapporo, Yokohama, and Sendai regions uses 50 Hz power.

Many other countries, such as Germany, the Netherlands and most European Union countries have standardized on 50 Hz.

To ensure safety and accuracy in the procedures, perform the procedures as they are described.

This Appendix is divided into the following categories:

- Locations Using 60 Hz Power (North America and Japan), page B-2
- Locations Using 50 Hz Power (Locations other than North America and Japan), page B-7.

LOCATIONS USING 60 HZ POWER (NORTH AMERICA AND JAPAN)

The following power requirements and instructions are for North America, much of Japan, and other locations using 60 Hz power. All other locations should refer to the instructions found in "Locations Using 50 Hz Power (Locations other than North America and Japan)" on page B-7.

The model 200iPX/250iPX dynamometer requires a dedicated 240VAC single phase power outlet rated for 30A for proper operation. **Failure to follow these instructions could result in personal injury or damage to the dyno.** Connecting the dyno to the incorrect voltage will void the dyno warranty. Contact Dynojet with any questions.

The model 200iPX/250iPX dynamometer requires a dedicated wall receptacle which must be wired for operation and is included with the dyno or may be shipped in advance in a separate package. The dyno is equipped with a ten foot power cord with a twist lock plug pre-wired on the end. The power cord is located at the front of the dyno, but is shipped inside of the dyno. For more information on the location and routing instructions for the power cord refer to your dyno installation guide.

The dedicated wall receptacle is a twist lock four wire grounded 30A NEMA L14-30 type and must be wired in accordance with local building codes and requirements. If the facility does not have 120/240 volt single phase power, and it does have 120/208 volt three phase Y power, then it is acceptable to connect the four-wire receptacle with two of the three phase lines, the neutral and the ground. With this arrangement, there will only be 208 volts between line 1 and line 2 instead of 240 volts. This is acceptable, but performance of the retarder will be reduced. **In no case shall all three phase lines be connected to the receptacle!** Installation may require a licensed electrician and must conform to UL and NEC safety standards.

> **Note:** If you are installing your dyno in North America or Japan and the dyno is not equipped with twist lock four wire grounded plug, contact Dynojet before attempting to connect the dyno.

Local and national electrical codes require a grounded receptacle box.

- This circuit should have a dedicated 30A double pole circuit breaker.
- The dyno should be the only device connected to this circuit.
- It may be necessary to install a delayed trip breaker due to the inrush current drawn by the high pressure blowers.

INSTALLING THE WALL RECEPTACLE

The wall receptacle is included with your dyno and is shipped in a box in the center of your dyno or may be shipped in advance in a separate package.

The wall receptacle is a single phase 240 volt 30A dedicated circuit with a neutral connection and a ground. The neutral connection is required to split the 240 volt into two 120 volt connections internal to the dyno.

The cable carrying the power to this receptacle should be ten gauge or larger. Check with local building codes for the correct size.

1 Connect one of the 240V legs (line 1) to the X terminal (gold colored screw).
2 Connect the other 240V leg (line 2) to the Y terminal (gold colored screw).
3 Connect the neutral conductor to the W or WH terminal (silver screw).
4 Connect the ground conductor to the green grounding screw.

TESTING FOR CORRECT VOLTAGES

You must test the receptacle for proper voltages before the dyno is connected to the outlet.

CAUTION

If the voltage readings do not match the following table, DO NOT connect the dyno. You must have a licensed electrician correct the power connection. Connecting the dyno to the incorrect voltage can result in damage to the dyno and will void the dyno warranty. Contact Dynojet with any questions.

Using a voltmeter that is capable of measuring AC voltage, measure between the points listed below and verify that the correct voltages are present.

probe 1	probe 2	desired voltage measurement
2	4	216V to 260V*
1	4	108V to 130V
1	2	108V to 130V
1	3	<5V
3	box	<5V

*If using two of the three phase lines of a 120/208V 3 phase Y system, then expect to see 187V to 225V.

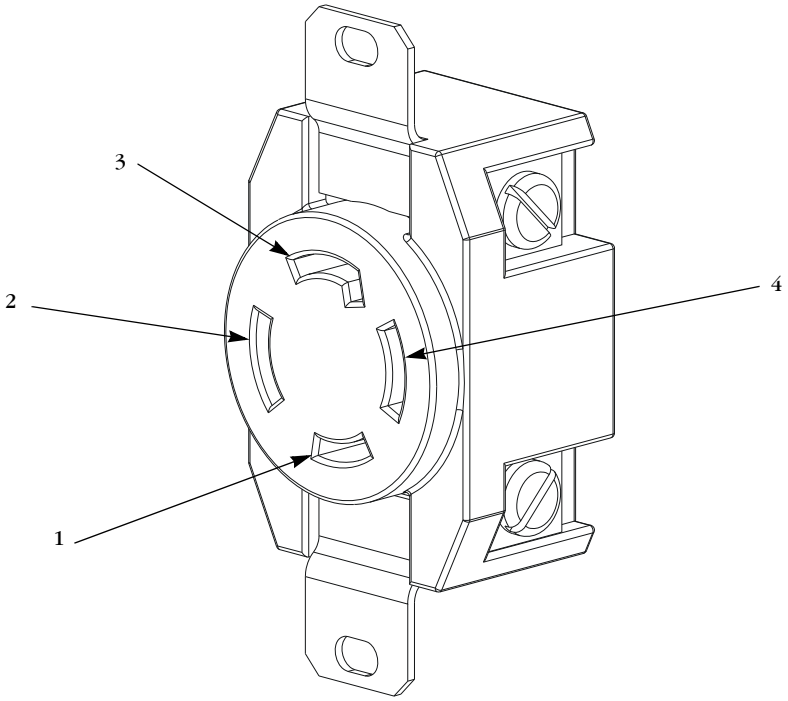


Figure B-1: Dedicated Power Receptacle

REPLACING THE POWER PLUG

Use the following instructions to replace the four wire plug and socket.

The plug and socket configuration must be rated for at least 240VAC 30A and have a minimum of four conductors.

The power cord that attaches to the dyno has four conductors internally and their colors are brown, gray, black, and green/yellow.

1 Connect 240VAC single phase power between the brown and the black wire connection points.
2 Connect the green/yellow wire to the ground connection point.
3 Connect the gray wire to the neutral connection point.
4 Refer to the previous table for testing and probe the new connections as follows:
   - black wire as location #2
   - brown wire as location #4
   - gray wire as location #1
   - green/yellow wire as location #3

HARD WIRING TO THE BUILDING

Use the following instructions to wire the dyno directly to the building.

The dyno must connect to a two pole disconnect switch to allow the removal of all power to the dyno for servicing. This box may contain fusing, circuit breakers, or the circuit protection may be upstream in the building power system. The circuit must be protected to 30A with slow blow fuses or time delayed circuit breakers.

The power cord that attaches to the dyno has four conductors internally and their colors are brown, blue, black, and green/yellow.

1 Remove the dyno power plug and connect 240VAC single phase between the brown and the blue wires through the disconnect switch.
2 Connect the green/yellow wire to the ground connection.
3 Wrap the black wire with white tape to denote that it is a neutral connection and connect it to the neutral connection.
4 Refer to the previous table for testing and probe the new connections as follows:
   - black wire as location #2
   - brown wire as location #4
   - gray wire as location #1
   - green/yellow wire as location #3

CONNECTING THE DYNO

1. Turn off the main circuit breaker on the dyno. The main breaker is located in the CPI door. Off is the down position.
2. Once you verify the voltages on the receptacle, connect the dyno to the receptacle.
3. Connect the high pressure blowers to the dyno. For more information on connecting the blowers, refer to your dyno installation guide.
4. Turn on the main dyno breaker.
5. Test the blowers for operation.
6. Turn on the dyno electronics and verify operation.
7. Test the control panel operations. For more information, refer to your dyno installation guide.

LOCATIONS USING 50 HZ POWER (LOCATIONS OTHER THAN NORTH AMERICA AND JAPAN)

The next section of this appendix contains the power requirements and instructions for dyno installations excluding North America and 60 Hz areas of Japan.

> **Note:** Refer to page B-2 for power requirements and instructions for North America and Japan.

The model 200iPX/250iPX dynamometer (excluding North America and Japan) requires a dedicated wall receptacle which must be wired for operation and is included with the dyno or may be shipped in advanced in a separate package. The dyno is equipped with a ten foot power cord with a three-pin IEC plug pre-wired on the end. The power cord is located at the front of the dyno, but is shipped inside of the dyno. For more information on the location and routing instructions for the power cord refer to your dyno installation guide.

The model 200iPX/250iPX dynamometer requires a dedicated 240VAC **single phase** power outlet rated for 30A for proper operation. **Failure to follow these instructions could result in personal injury or damage to the dyno.** Connecting the dyno to the incorrect voltage will void the dyno warranty. Contact Dynojet with any questions.

The dedicated wall receptacle is a three-pin IEC grounded 30A type and must be wired in accordance with local building codes and requirements. Installation may require a licensed electrician to conform to applicable safety standards.

CAUTION

If you are installing your dyno in a location other than North America or Japan and the dyno is not equipped with a three pin IEC grounded plug, contact Dynojet before attempting to connect the dyno.

Local and national electrical codes will require that the box containing the receptacle is grounded.

- This circuit should have a dedicated 30A double pole circuit breaker.
- The dyno should be the only device connected to this circuit.
- It may be necessary to install a delayed trip breaker due to the inrush current drawn by the high pressure blowers.

INSTALLING THE WALL RECEPTACLE

The wall receptacle is a single 240 volt 30A dedicated circuit with a ground.

The cable carrying the power to this receptacle should be 4.0 mm^2 (ten gauge) or larger. Check with local building codes for the correct size.

1 Connect one of the 240V legs to the N terminal (white).
2 Connect the other 240V leg to the L terminal (no color).
3 Connect the ground conductor to the green terminal.

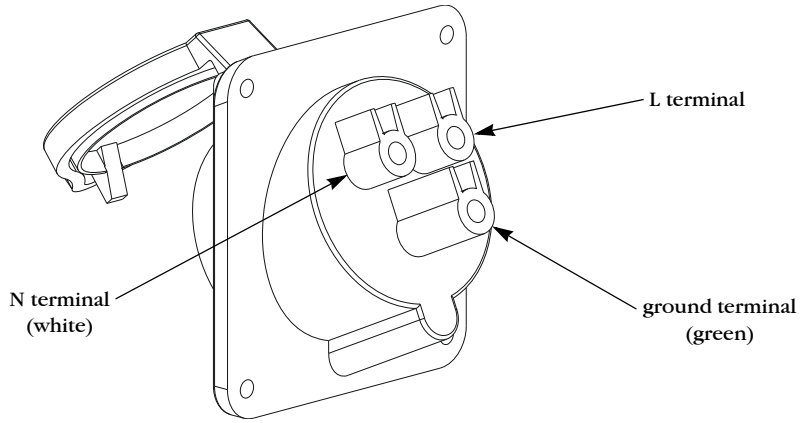


Figure B-2: Wire the Wall Receptacle

TESTING FOR CORRECT VOLTAGES

You must test the receptacle for proper voltages before the dyno is connected to the outlet.

Using a voltmeter that is capable of measuring AC voltage, measure between the points listed below and verify that the correct voltages are present.

probe 1	probe 2	desired voltage measurement
1	3	220V to 250V
2	box	<5V

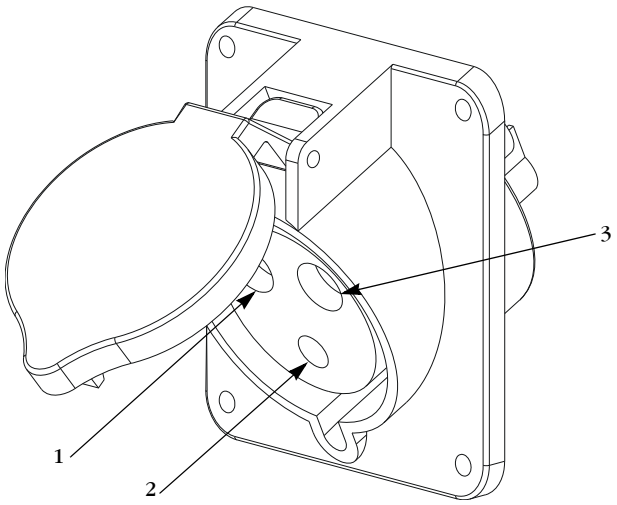


Figure B-3: Test the Wall Receptacle

Replacing the Power Plug

Use the following instructions to replace the plug and socket.

The plug and socket configuration must be rated for at least 240VAC 30A and have a minimum of three conductors.

The power cord that attaches to the dyno has four conductors internally and their colors are brown, gray, black, and green/yellow.

1 Connect 240VAC **single phase** power between the brown and the gray wire connection points.
2 Connect the green/yellow wire to the ground connection point.
3 Cut off the gray wire.
4 Refer to the previous table for testing and probe the new connections as follows:
   - black wire as location #1
   - brown wire as location #3
   - green/yellow wire as location #2

Hard Wiring to the Building

Use the following instructions to wire the dyno directly to the building.

The dyno must connect to a two-pole disconnect switch to allow the removal of all power to the dyno for servicing. This box may contain fusing, circuit breakers, or the circuit protection may be upstream in the building power system. The circuit must be protected to 30A with slow blow fuses or time-delayed circuit breakers.

The power cord that attaches to the dyno has four conductors internally and their colors are brown, blue, black, and green/yellow.

1 Remove the dyno power plug and connect 240VAC single phase between the brown and the blue wires through the disconnect switch.
2 Connect the green/yellow wire to the ground connection.
3 Cut off the gray wire.
4 Refer to the previous table for testing and probe the new connections as follows:
   - black wire as location #1
   - brown wire as location #3
   - green/yellow wire as location #2

CONNECTING THE DYNO

1. Turn off the main circuit breaker on the dyno. The main breaker is located in the CPI door. Off is the down position.
2. Once you verify the voltages on the receptacle, connect the dyno to the receptacle.
3. Connect the high pressure blowers to the dyno. For more information on connecting the blowers, refer to your dyno installation guide.
4. Turn on the main dyno breaker.
5. Test the blowers for operation.
6. Turn on the dyno electronics and verify operation.
7. Test the control panel operations. For more information, refer to your dyno installation guide.

APPENDIX

C

EEC FINGER GUARD AND DOOR SAFETY SWITCH INSTALLATION

This appendix contains instructions for installing the EEC Kit to the in ground model 200iP/250iP motorcycle dynamometers. This appendix will walk you through installing the EEC finger guards and door safety switch. The finger guards and door safety switch are required only for European dynamometers. To ensure safety and accuracy in the procedures, perform the procedures as they are described.

For more information refer to the Air Brake and EEC Kit Installation Guide, P/N 98123114.

EEC FINGER GUARDS

The European model 200iP/250iP dynamometers require guards mounted on the front and back of the drum guard bracket. The EEC finger guards provide extra protection from the drum by regulating the distance between the drum and the chassis. The placement of the finger guards can be manually adjusted.

WARNING

Do not operate the dynamometer without the EEC finger guards properly installed. The gap between the finger guards and the drum must be less than 0.64 centimeters (0.25 inches). Refer to page C-3 for instructions on adjusting the gap.

INSTALLING THE EEC FINGER GUARDS

1 Secure each EEC finger guard to the drum guard mount using two 1/4-20 x 5/8-inch pan head screws.

2 Continue with installing the pit covers on page 2-48.

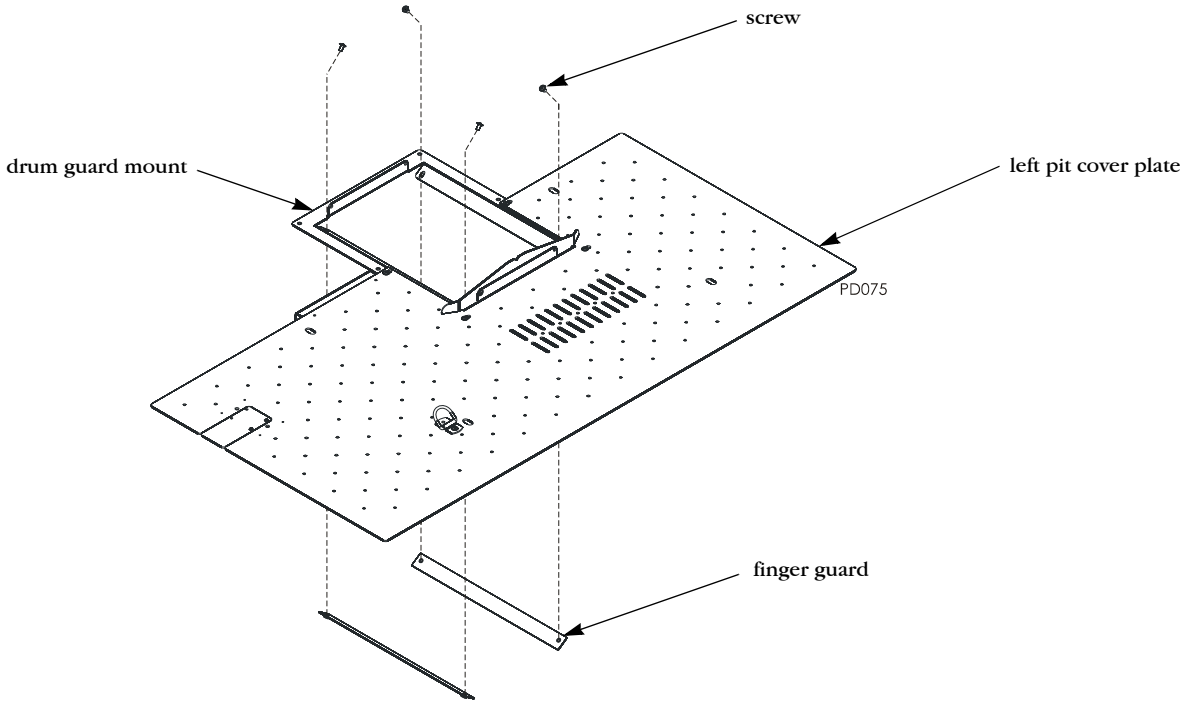


Figure C-1: Install the EEC Finger Guards

ADJUSTING THE EEC FINGER GUARDS

Once the pit cover plates are installed and adjusted, the EEC finger guards will need to be adjusted.

1 Loosen the 1/4-20 x 5/8-inch pan head screws and adjust the EEC finger guards so they are 0.16 cm to 0.64 cm (.0625 in. to .25 in.) from the drum. Tighten the screws.

2 Check the EEC finger guards regularly to verify the clearance has not changed.

WARNING

Do not operate the dynamometer without the EEC finger guards properly installed. The gap between the finger guards and the drum must be less than 0.64 centimeters (0.25 inches).

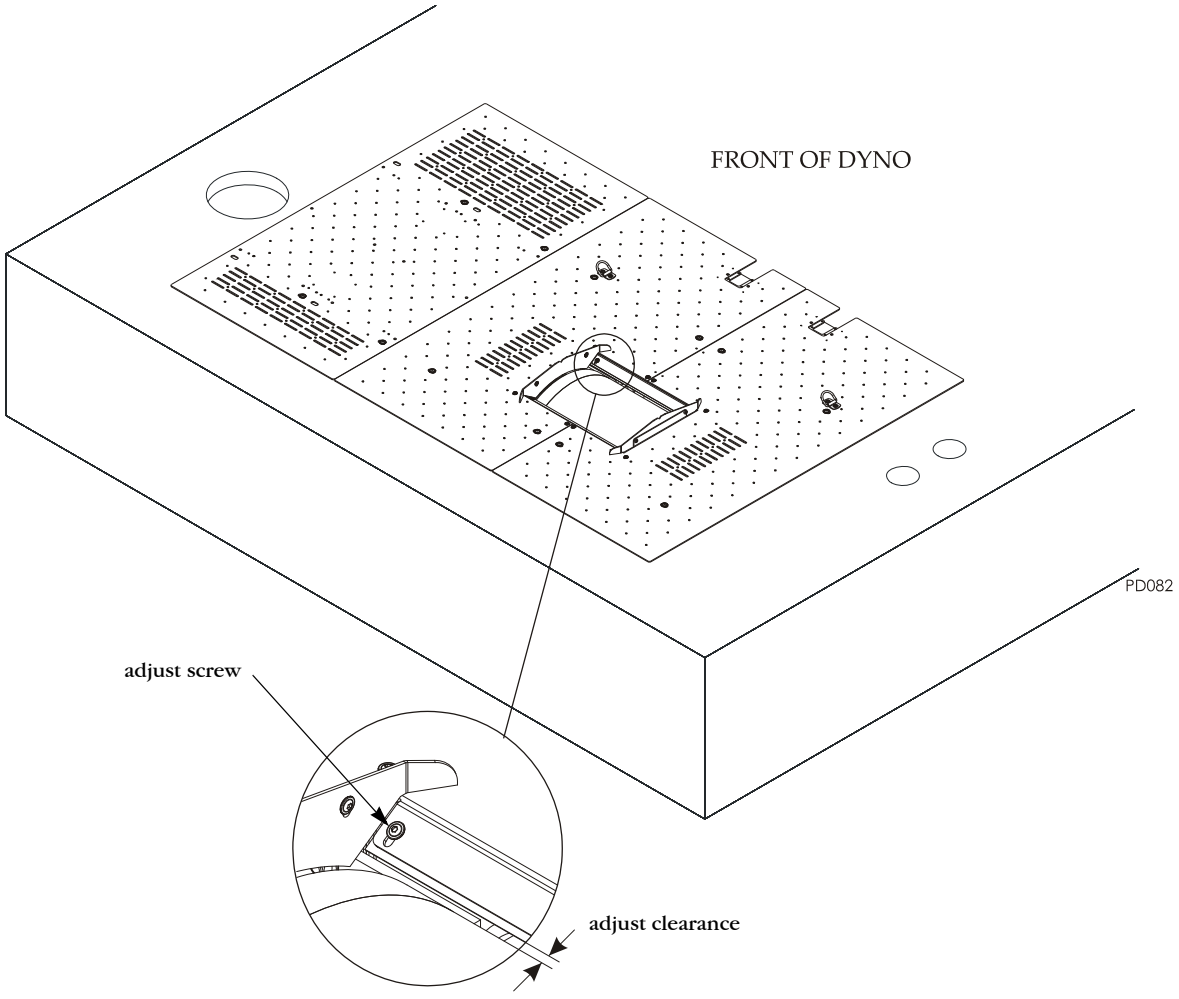


Figure C-2: Adjust the EEC Finger Guard Clearance

DOOR SAFETY SWITCH

Safety requirements of your local country may require that a door safety switch is installed. Be sure to follow the safety requirements specific to your country. The door safety switch requires the air brake to work. This switch is located on the dyno room door and is triggered when the pressure applied to it is released causing the air brake to lock. This prevents the dyno from being used when the door is open.

WARNING

Components attached to and within the dynamometer operate with potentially lethal voltages. To provide the greatest assurance of safety, the AC power cord(s) must be disconnected from the power source before servicing electrical components or wiring. Disconnect all power cords before servicing electrical components for the greatest assurance of safety.

INSTALLING THE DOOR SAFETY SWITCH

1 Open the CPI front panel access and turn off the main breaker.
2 Unplug the dyno power cable.
3 Remove the eight button-head screws securing the CPI cover and set aside.
4 Remove the cover and set aside.

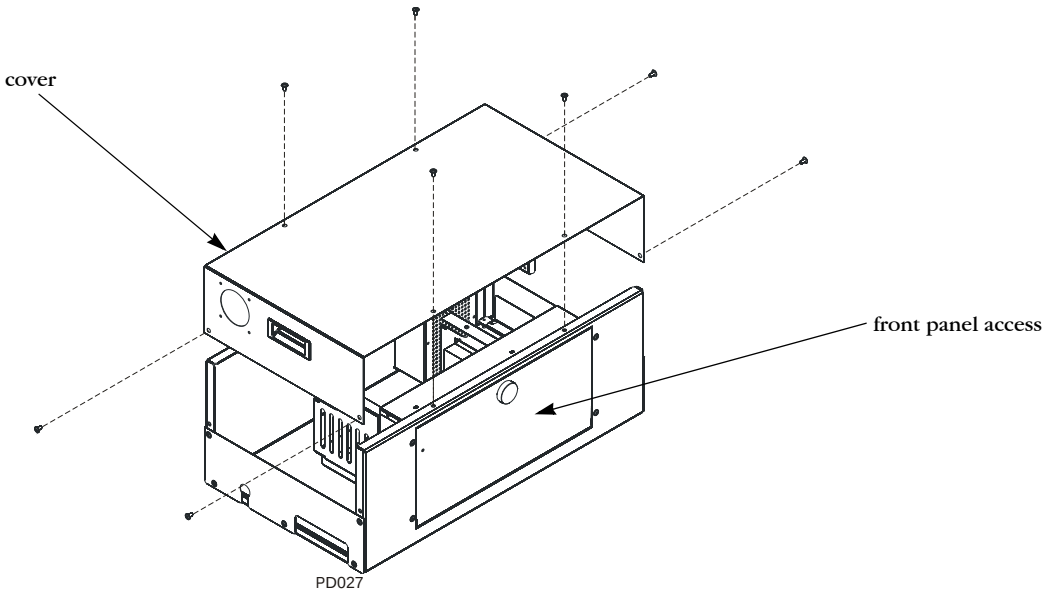


Figure C-3: Access the CPI

5 Loosen the screws that hold the jumper wires in place and remove the wire.

6 Route the black and yellow wire from the door safety switch through the dyno.

Make sure the switch will not get caught in any moving components or chafed on any edges.

7 Attach the yellow wire to the 1A position on the J2 connector.

8 Attach the black wire to the 6B position on the J4 connector.

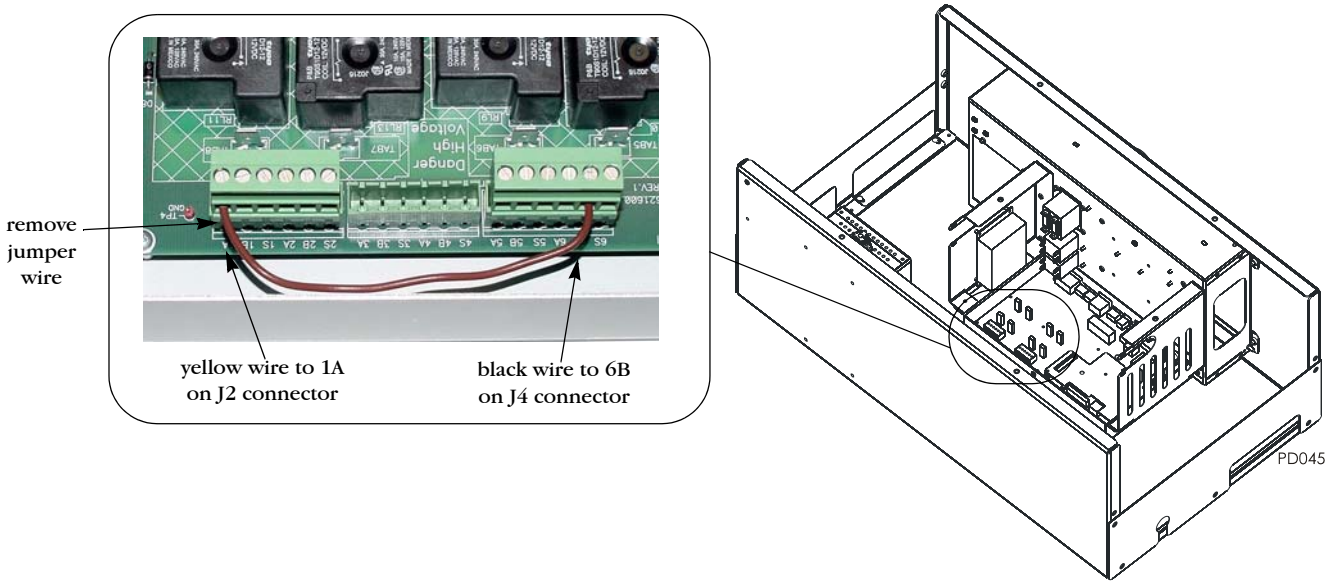


Figure C-4: Wire the Door Safety Switch

9 Replace the CPI cover using the screws removed earlier.

10 The door safety switch needs to be mounted at the entry of the dyno room.

11 Plug the dyno into the power outlet.

12 Turn on the main breaker inside the CPI door.

13 Open the door safety switch by allowing the plunger to extend.

The air brake should be applied holding the drum and the status light on the Control Panel will be flashing.

14 Depress the door safety switch and the air brake will release and the status light will be on steady.

APPENDIX

D

THETA CONTROLLER

This appendix describes how to make power adjustments on the theta controller. To ensure safety and accuracy in the procedures, perform the procedures as they are described.

POWER ADJUSTMENT

The 240 VAC theta controller is calibrated for a nominal 230 to 240 VAC line voltage; in certain countries, line voltages of 210 to 220 VAC may be encountered and the dip switch can be set to provide full output current of 10 amps even with the reduced line voltage.

Note: This controller cannot be converted to operate on 120 VAC line voltage.

WARNING

Hazardous voltage. To avoid risk of electrical shock, disconnect the power cord to the theta controller. Do not remove the cover. No user serviceable parts inside.

Accessing the Dip Switches

Dynojet recommends you set the dip switches at the time of installation.

CAUTION

The two dip switches are the only adjustments that can be altered. Be sure not to damage any other parts on the circuit board. Do not attempt any other adjustments.

1 Access the dip switches through a hole in the bottom of the theta controller.
2 Use a small screwdriver to set the dip switches for the desired line voltage.

Power Line Frequency Adjustment—The theta controller is shipped with the dip switch set for 60 Hz. In some cases, the dip switch is set based on the country it is shipping to. However, you will need to determine the correct line frequency and set the switch accordingly.

60 Hz Power Line Frequency Adjustment—For all of North America, this switch should be set to the 60 Hz position. In Japan, there may be either 50 Hz or 60 Hz power line frequency; determine the correct line frequency and set the switch accordingly.

Power Line Voltage Adjustment—The theta controller is shipped with the dip switch set for normal (NORM) line voltage. In the NORM position, the controller is calibrated for a nominal 235 to 240 VAC line voltage.

In some cases in Europe or Japan, it may be necessary to set the dip switch to the LO position when the AC line voltage is consistently around or below 225 VAC and combined with reduced brake performance.

- Measure the AC line voltage with all normal AC loads running in the shop (lights, heater, etc.).
- If the line voltage is reduced to or below 225 VAC and remains at these levels, move the switch to the LO position. This will boost the output current with the lower AC power voltages.

  Note: If the AC power voltage returns above the 230 VAC range while the dip switch is set to LO, overheating and damage to the eddy current brake or fuse failure may result. Review the LO/NORM dip switch position setting and re-measure your incoming AC line voltage.

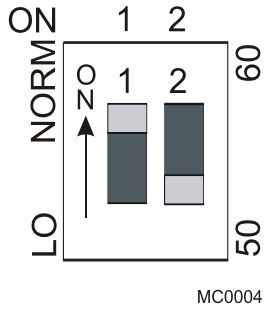


Figure D-1: Theta Controller Dip Switch Settings

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